

MODEL ★ AIRPLANE NEWS

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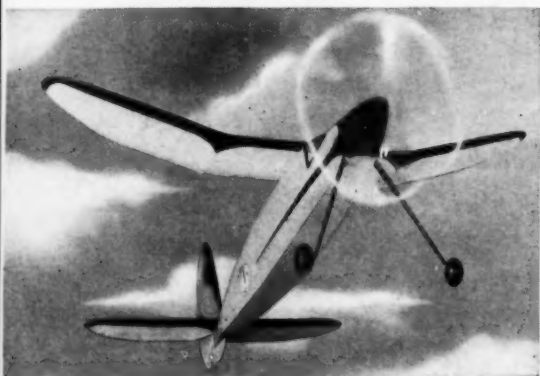
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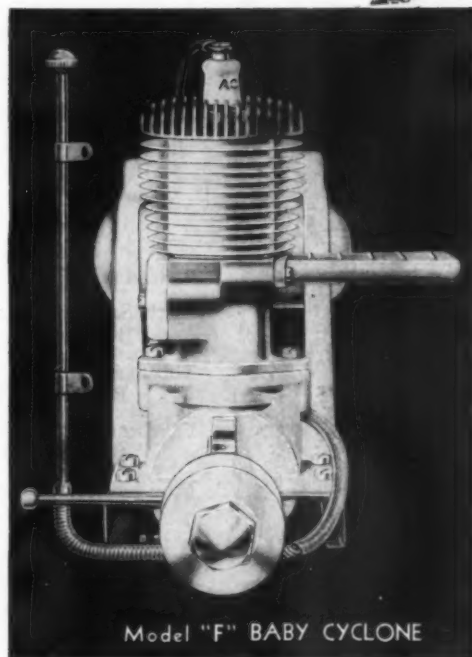
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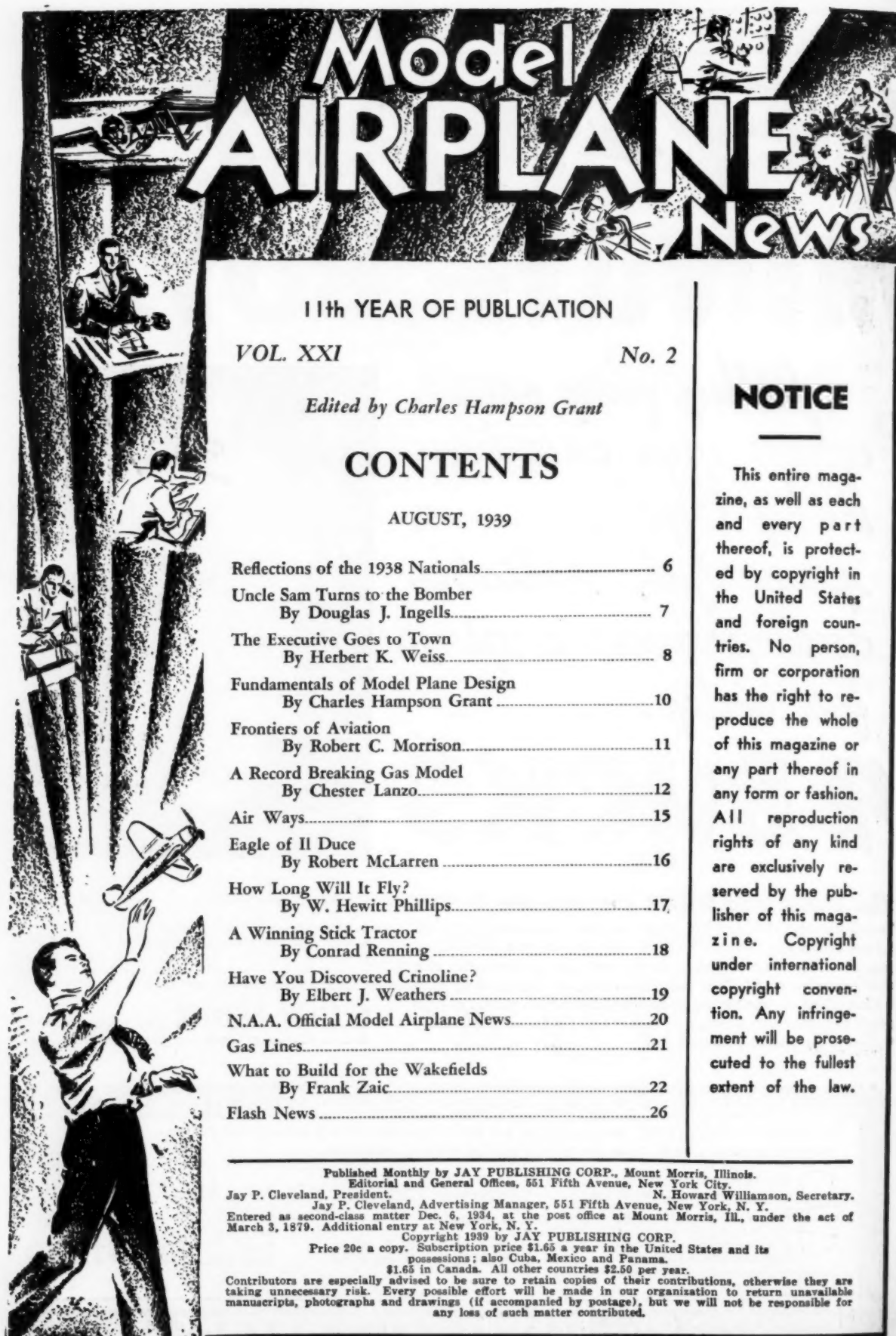
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Model AIRPLANE News

11th YEAR OF PUBLICATION

VOL. XXI

No. 2

Edited by Charles Hampson Grant

CONTENTS

AUGUST, 1939

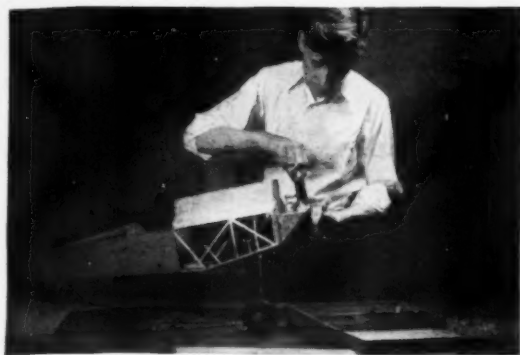
Reflections of the 1938 Nationals.....	6
Uncle Sam Turns to the Bomber By Douglas J. Ingells.....	7
The Executive Goes to Town By Herbert K. Weiss.....	8
Fundamentals of Model Plane Design By Charles Hampson Grant.....	10
Frontiers of Aviation By Robert C. Morrison.....	11
A Record Breaking Gas Model By Chester Lanzo.....	12
Air Ways.....	15
Eagle of Il Duce By Robert McLaren.....	16
How Long Will It Fly? By W. Hewitt Phillips.....	17
A Winning Stick Tractor By Conrad Renning.....	18
Have You Discovered Crinoline? By Elbert J. Weathers.....	19
N.A.A. Official Model Airplane News.....	20
Gas Lines.....	21
What to Build for the Wakefields By Frank Zaic.....	22
Flash News.....	26

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Published Monthly by JAY PUBLISHING CORP., Mount Morris, Illinois.
Editorial and General Offices, 551 Fifth Avenue, New York City.
Jay P. Cleveland, President. N. Howard Williamson, Secretary.
Jay P. Cleveland, Advertising Manager, 551 Fifth Avenue, New York, N. Y.
Entered as second-class matter Dec. 5, 1934, at the post office at Mount Morris, Ill., under the act of March 3, 1879. Additional entry at New York, N. Y.
Copyright 1939 by JAY PUBLISHING CORP.
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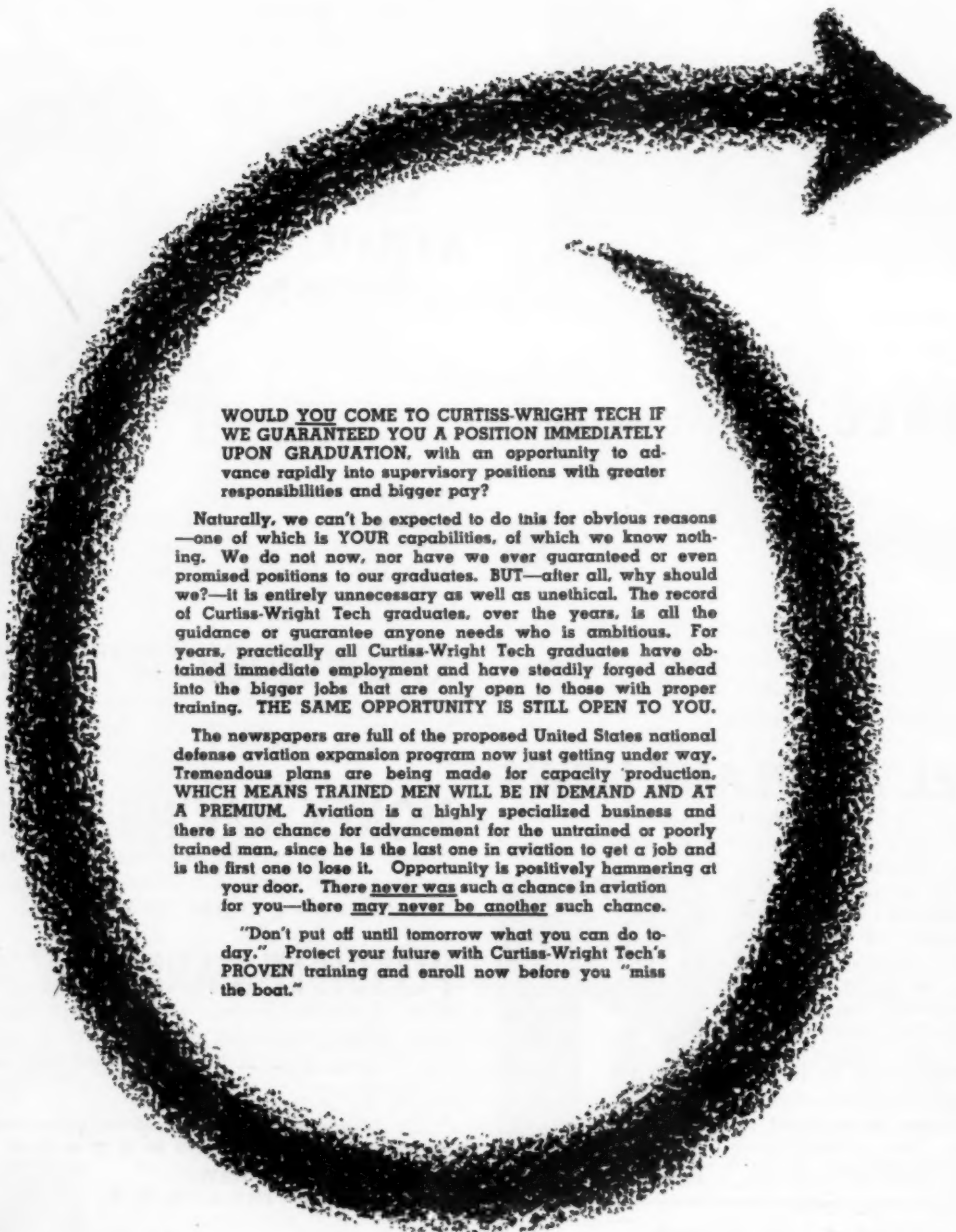
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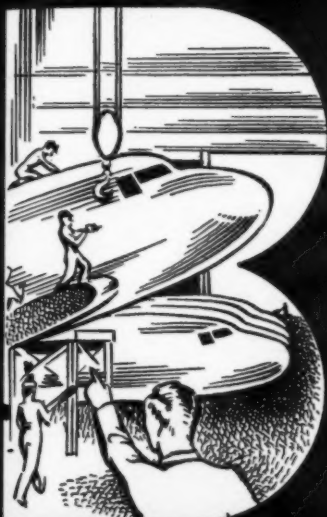
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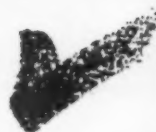
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Reflections Of The 1938 Nationals





The latest Martin bomber designed for large scale production has two 1830 hp. engines. (Internatl.)

Uncle Sam Turns to the Bomber

WHEN President Roosevelt and Congress started the new drive for U.S. Air Corps expansion nothing much was said about what type planes would be purchased to help bolster our air defense. However now the secret is out. Uncle Sam is going

to help the doughboys and other ground forces, which means the Air Corps has taken a new interest in attack aviation.

As proof of this sudden change of trend procurement, early in March officials at Wright Field opened bids on three attack bombers, a comparatively new type of fighting plane which heretofore has seen little service by the army. Behind closed doors Air Corps officials and aircraft manufacturers discussed contracts and bids which ranged from \$993,000 for a single plane to \$51,000 for each plane in lots of 2,000.

Three of the new high-speed bombers were flown to Wright Field by the Glenn L. Martin Corp., Balti-

BY DOUGLAS J. INGELLS

more, Maryland, the Stearman Aircraft Corp., Wichita, Kansas, and the North American Aviation Corp., Inglewood, California. The planes were entered in the biggest army competition since 1934, when Boeing Company, Douglas and the Martin Corp. sent new design to the field for the famous "contest of the three" which resulted in the purchase of such planes as the "Flying Fortresses," the Douglas B-18's, and the Martin B-12's.

This year's competition has two of the original three competing again, Stearman Corp. being part of the Boeing Company. Douglas is expected to send a last minute entry. If this ship arrives in time it will be one similar to the Douglas light bomber that crashed last February with a French Air Ministry official aboard—the ship that started a political scandal relative to America's "secret foreign policy."

The new attack bombers, according to reliable information, are capable of speeds in excess of 300 miles per hour while carrying at least half a ton of bomb load.

An Air Corps officer close to the procurement activities for a number of years told this writer:

"We already have giant bombers in service which are capable of carrying great loads of explosives for long distances, but at present the Air Corps lacks a good, fast, light, attack bomber.

(Continued on page 42)



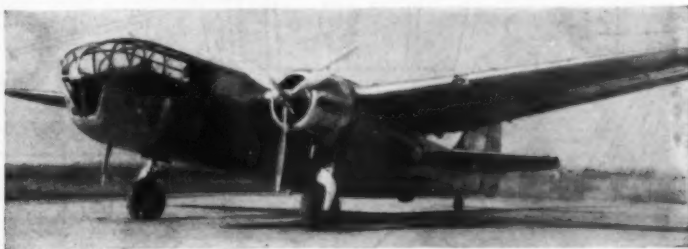
The giant Boeing B-15 bomber. This type acts as the second line of defense. A pursuit plane is beneath it. (Off. U.S. Army)



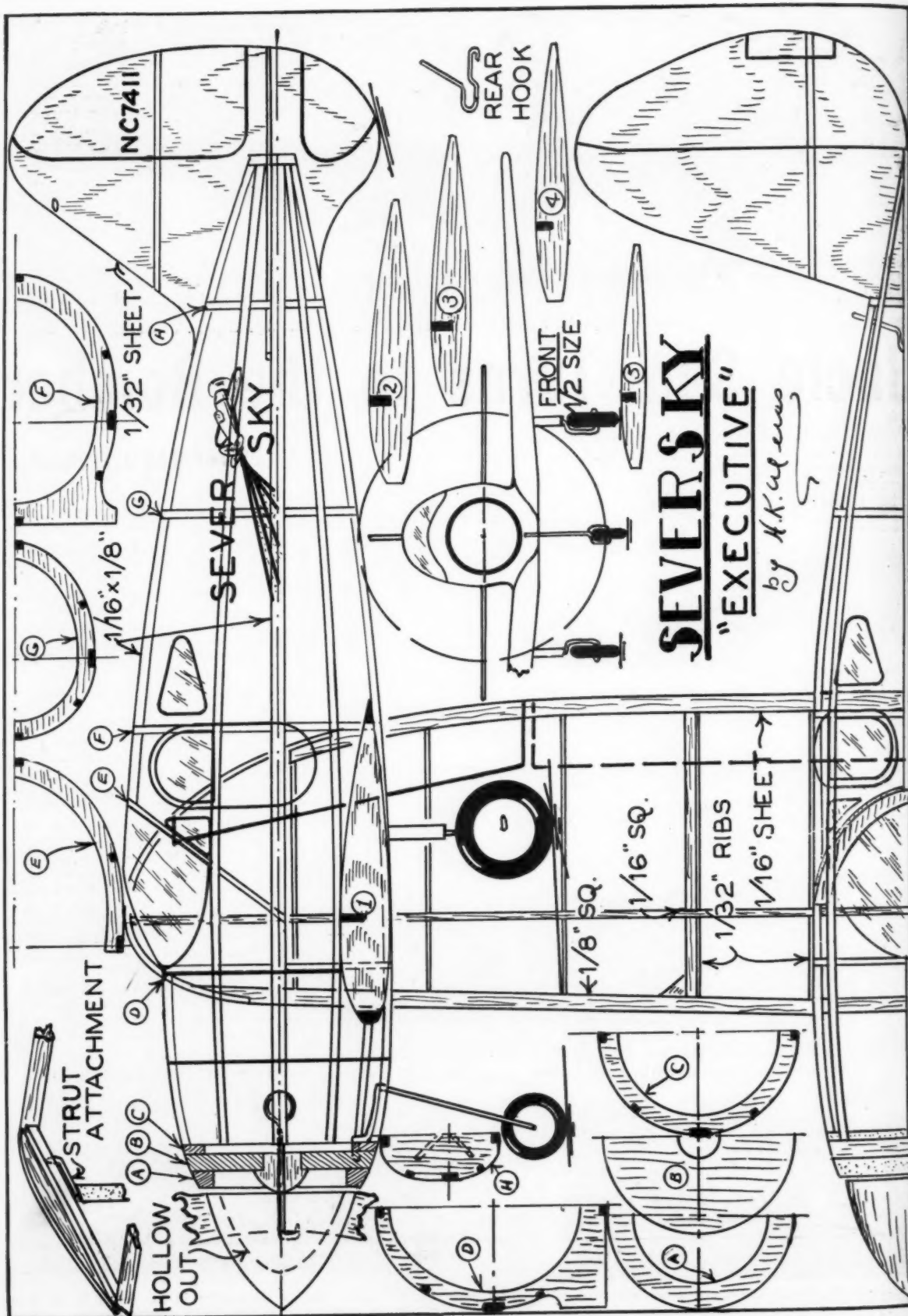
The new North American bomber attack plane, recently tested. (Bowers)

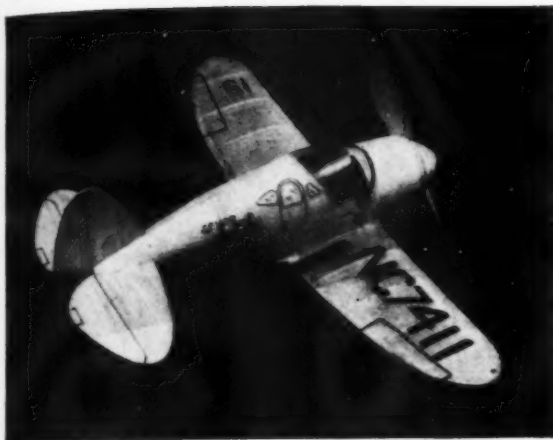


Remains of the North American bomber just after its crash. (Bowers)

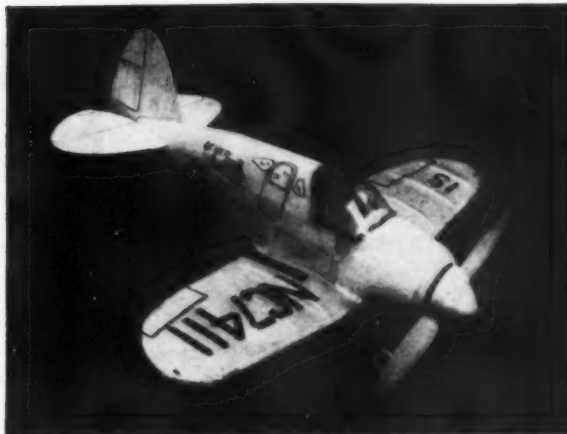


The Stearman attack bomber, one of the entries in the recent U. S. Army bomber competition at Wright Field. (Bowers)

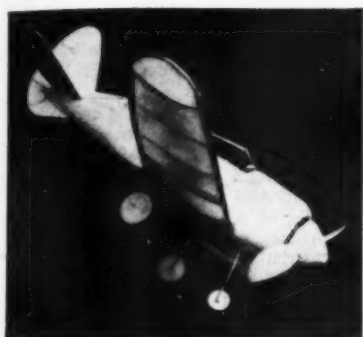




The large tail surfaces give stability



The balsa fuselage provides great sturdiness



A three-wheel landing gear provides thrilling, realistic "take offs"

MAJOR ALEXANDER P. DE SEVERSKY has done it again. While other more conservative designers were checking and rechecking the trend of public opinion and the slope of the modern economic situation, de Seversky went ahead and built the ship that showed them what will be the style in airplanes by the time they get around to building their "dream ships."

The latest Seversky "Executive" incorporates a retractable tricycle landing gear, one of the first on a really high-speed ship of the fighter class. (That inimitable Dutchman, Tony Fokker had one at the last Paris show.) Fowler flaps are incorporated. Standard equipment includes two-way radio, automatic pilot, de-icer equipment and a complete layout of instruments. The ship is designed for a 1200 hp. Twin Wasp under the new N.A.C.A. nose-slot cowl, and a huge spinner superstreamlines the nose. Outer wing panels are interchangeable with panels of larger area including bigger gas tanks to boost the range from 850 to 2000 miles. Ship seats four normally.

Yeah, pal, you guessed it. How many "executives" in the United States have businesses that would justify one of these delicious go-buggies? Jimmy Doolittle and a couple of others have booked orders, indicating that this new ship will follow Seversky pylon-to-pylon, city-to-city and coast-to-coast tradition. But when we look at those performance specifications: 330 m.p.h. top speed, 300 m.p.h.

The Executive "GOES TO TOWN"

A Sturdy Realistic Fine Flying Three-Wheel Landing Gear Ship That You Can Build Easily and Quickly

By HERBERT K. WEISS

cruising, 2900 ft. min. climb,—you know, with modern fighters getting faster and faster and landing speed going up and up, we're willing to bet that when there get to be more hot ships than super pilots it's going to feel mighty good to the not-so-good reserves to have that ground-stable tricycle under them, not to mention the stainless steel belly-skid. Oops, we forgot,—the Executive is being built as a "commercial" ship. Or did we?

Anyhow, you go about building your own Private Parlor Pursuit in the following fashion. Start with the wing.

Wing

The wing is made in one piece for strength. You can lay it out over the plan, putting a piece of waxed paper down first, of course, and just pin the pieces to hold them while the cement is drying. The trailing edge is cut from 1/16" sheet balsa, and you can trace the outline on the balsa with a piece of carbon paper if you don't feel quite up to the surprisingly easy job of cutting it to fit by eye. If you want to be sure of getting your wing panels alike, you can also trace the wing layout on another sheet of paper, placing the carbon sheet face up under the blank paper, so that your tracing is reversed. Sounds complicated but try it and you'll get the idea. Then just paste your tracing against the

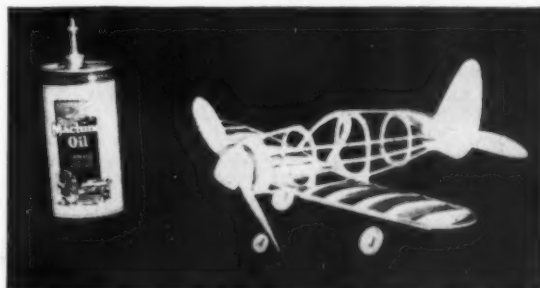
right wing half on the plan, and you'll have the full wing layout.

We found that the wing of our model was plenty rigid without a main spar. However, many model builders prefer to build their wings with leading edge, trailing edge and main spar, and you can

(Continued on page 34)



In full flight immediately after launching. Note its fine flight balance



The frame is simple and may be assembled quickly. Though small it gives a "big" performance

Article No. 1

THE desire for freedom of action, to travel without restriction—that is the urge which usually is responsible for anyone “taking up” aviation in one form or another. Some like to experience the physical thrill of flying, others enjoy the exploration of the boundless realms of science which aviation embodies.

However, there are many who are unable to fly for one reason or another and who lack the money and facilities required of those who undertake to delve into the science of full scale aviation. Participation in both of these phases is expensive business, and is hardly the first step that the layman or boy can take conveniently.

The introduction to such a worthy science or pastime should not be so severe on pocketbook, mind or physique that further participation in it is discouraged. Everyone wishes to identify himself with success, not failure. Therefore the first “venture” in aviation should be an easy and enjoyable one. One that may be concluded successfully, resulting in a burning desire to fathom the mystery of flight.

Thus it is logical that newcomers to the aviation field should turn to MODEL aeronautics. Participation in this branch of the science in one form or another is well within the scope of everyone. It involves little expense or danger, yet in it is embodied every scientific problem that may be identified with full scale aviation. All the thrills of actual flight are enjoyed by the “aviator” while he stands solidly on “Mother Earth” watching his plane execute every maneuver that might be expected of its man-carrying prototype. All of this is verified by the fact that there are many former builders who are successful men in aviation today. They laid the foundation of their success by learning the principles of flight and plane design through the medium of model planes.

Probably the most intriguing characteristic of this sport is the element of mystery that pervades it. There is always a new problem to solve, something new to discover. It provides “fun while learning” to all who participate in it. In brief: a sugar-coated education.

Usually the start of active participation in model aviation is prompted by inspiration born of some intriguing or dramatic episode. Lindbergh's flight literally started hundreds of romantic and imaginative young men building models. Many of these are experts today because of patience and a determination to solve the problems of design, construction and flight that presented themselves. Many “dropped by the wayside” because of discouragement generated by repeated failures in their attempts to create successful flying models. Some of these drifted into the pastime of building non-flying scale models until they had absorbed sufficient experience and courage to undertake again the creation of successful flying model planes.

It is the *beginner* that experiences the most discouraging moments to be found in model aviation. He is faced with the problem of WHERE to begin.

Several courses are open to him: He can buy a kit containing plans and material to

Fundamentals of Model Plane Design

How Model Airplane Designing Building and Flying Will Provide A Complete Education in Aviation—Required Basic Factors of Flight

By CHARLES HAMPSON GRANT

build a complete model, or he may undertake to lay out the proportions and structure of a plane on his drawing board, buy the material and build it. The first manner of procedure is the one which probably will bring him the greatest success, for it requires less knowledge and experience. Nevertheless after the plane is complete and the problem of flying it presents itself, the builder suddenly realizes that it requires at least a little knowledge of the theory of flight in order to make the little craft perform as a self-respecting airplane should.

Those who are courageous enough to endure the discouraging effects of innumerable crashes and rebuildings of their planes will eventually succeed, through cut-and-try methods, in producing model planes of fine performance. This is the procedure by means of which most model builders have acquired their ability. Through constant building they have attained the art of creating model planes of fine performance. However, these model fans are limited in the number of successful types of models that they can produce. They learn the correct proportions by cut-and-try methods. In this case the construction and testing of many planes is required before the correct proportions of the particular type have been established. Many potentially fine model designers and builders are lost to the sport because, by following this system, they become discouraged long before they attain success. The reason for failure in such cases is easy to understand.

It is obvious after a little consideration that even the most expert craftsman cannot construct any mechanism and have it operate properly unless he knows first how to give the correct proportions to the mechanism and its parts. Before any model fan can build a successful model plane he must know how it should be proportioned; what the relative sizes and shapes of its parts should be. The proportions of a model plane are governed by the fundamental principles of aerodynamic design.

Thus it is obvious that the first step to take on the road to creating successful planes is to master the primary principles of model plane design. A model plane that is misproportioned will not fly properly no matter how well it is constructed. So don't be only a builder of models. There is just as much difference between a builder and a designer of planes as there is between a blacksmith and an engineer.

If you will follow the procedure of first designing your planes and then constructing

them, they will fly successfully.

It is not difficult even for a beginner to design and proportion a model plane correctly. All that is required is to learn and apply a few simple fundamental rules of design. Rules that establish the basic proportions of a plane so that it will be stable and efficient in flight.

These rules may be applied and satisfactory results obtained without an understanding of the principles which govern the rules of design. However, a knowledge of these principles and the science upon which the rules of design are based will enable one to work out an infinite number of design variations that will conform more closely to requirements of performance.

Therefore in the following pages of this series of articles, first simple rules will be given which will enable beginners to build successful planes, then the underlying principles will be discussed for the benefit of those who wish to have an understanding of the science involved.

In order to know how to apply the basic rules governing the proportions of planes, it is necessary to know what basic parts or factors are required for flight, the collective physical expression of which form the complete structure of the airplane. Then if one is to comprehend how and why these factors function, a complete understanding of the scientific principles involved is required.

Therefore let us convert our problem to its simplest form and assume that we know nothing about an airplane. All that is known is what we wish to accomplish—that is: design and eventually construct a mechanism that will rise from the ground, travel through the air on an approximately predetermined course and come to rest again without damage to itself, after making contact with the ground.

The question is now: what factors are required in order that a device of some kind will complete such a performance in the desired manner?

First Factor of Flight—A Means of Lift

The most obvious quality that an airplane should have is the ability to get off the ground and remain suspended in flight for a definite period of time. In order to do this some force must be exerted on the airplane, opposite in direction to the force of gravity. Gravity holds the plane on the ground; therefore the lifting force must be greater than the gravity force in order that

(Continued on page 28)



U. S. Army Air Corps basic combat, BC-2, recently delivered to Wright Field for test. (Morrison)

FRONTIERS OF AVIATION

By ROBERT C. MORRISON

IT IS cheerful news to hear that though the demand for fighting planes is at a peak, the airplane manufacturers still give the commercial transport due consideration. While most of the companies are of course leaning towards military production where much money is at stake, some of the major manufacturers have found it a good opportunity to hop into the commercial field to catch their competitors off guard. The military business is not destined to last forever, but the demand for commercial aircraft will keep improving for many years to come.

Douglas has already sold several of its DC-5 transports, and the DC-4 will eventually see service in quantity on domestic airlines. K.L.M. of Holland will certainly buy some. However the tendency at the present time appears to be for lighter three and four engined transports; and several companies, including Douglas, are designing such ships.

Lockheed has already announced details of its new four-engined transport, the "Excalibur," which will weigh thirteen tons and seat 21 to 28 passengers with a crew of three. It will be low-wing in design and incorporate a tricycle landing gear, the nose wheel being steerable. Perhaps the steering mechanism will be hydraulically operated and may be a development of that designed by Mr. Otto Timm which is used on his twin-engined ship. Brakes will be used on all three wheels,

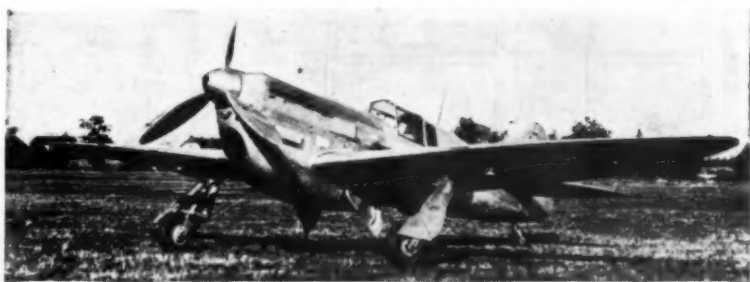
which are completely retractable. The plane will be of all-metal construction.

An important bit of news is that the Fowler flaps as used on the Lockheed "14" will not be used. An even more efficient flap will be a feature of the four-engined transport! The engines will be
(Continued on page 50)

The new Dornier three engine patrol boat. Note the gun turrets, fore and aft. (Bulban)



The Miles Master high speed advanced trainer with speed of 295 m.p.h. used by Royal Air Force



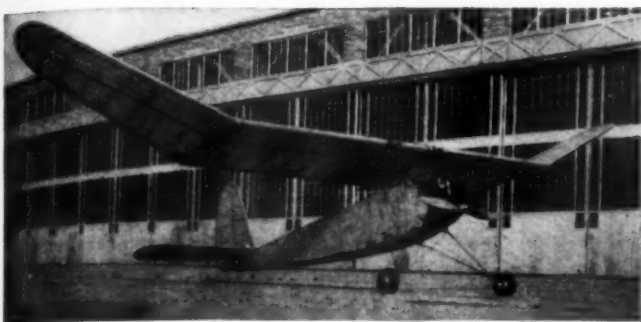
A modern high speed French pursuit, the Dewoitine D-513



The Willoughby Deta. Part of the wing surface is extended so the wing and stabilizer are practically one



The Praga E241, designed for operation from aircraft carrier decks. One of the standard Italian Navy planes



The finished plane is light and has large wing area

A RECORD BREAKING Gas Model

Here's a Gas Model That Made a World's Record for Duration and Weight Lifting—How You Can Build It

By **CHESTER LANZO**



The author, at right, waits to have his record breaking ship "gassed up"

TO PRODUCE a consistent champion-ship gas model, a ship must possess these two main flight characteristics.

Ability to Soar: Any ship will climb with a powerful riser "slamming it skyward," but to have a model take advantage of the slightest trace of a thermal and produce a long soaring glide is to have soaring ability.

Climbing Ability Under Pow-

er: Utilize every erg of energy in the motor to make the most of the limited run. Every foot of altitude gained in the climb is minutes added to the total length of the flight. Get the model high enough where the more active air currents will affect the ship.

This model has proven to have both of these characteristics to an amazing extent, plus an extreme in stability. In fact it is so stable that it can be made to circle right or left under power or in the glide without having to warp or twist the wings. As a weight-lifting or a radio-control job it cannot be beaten. This model won the Scripps-Howard contest for lifting the greatest weight and then remained in the air for the greatest length of time.

During a recent gas duration contest, with a motor run of 21 seconds, the plane remained aloft for 25 minutes. Upon returning to the field the ship was sent up again with a motor run of 25 seconds. This produced a flight of two hours covering a distance of 25 miles, and incidentally established a new world record.

This plane also incorporates the following desirable features: detachable wing, adjustable

rudder and elevator, crash-proof wire landing gear, flexible wire wing mount to eliminate wing breakage and to produce greater stability.

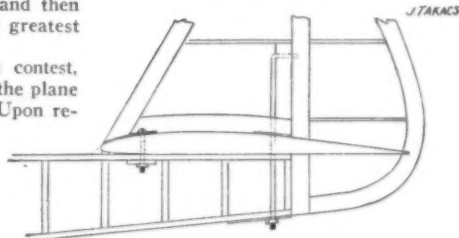
All of the excess frills and baggage are entirely eliminated, thus producing a straight-forward and simple but efficient design. Quoting one of the best model builders in the country, "Super-streamlining has a tendency to induce complicated and heavy structures."

Constructing the Plane

Start out with the intentions of spending two or more weeks of hard but enjoyable work on the construction of this model.

Its specifications are: Wing span, 8 feet; wing cord, 14 inches; wing loading, 8 ounces per square foot.

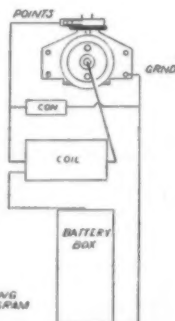
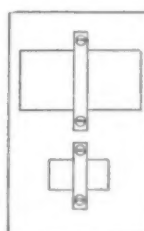
(Continued on page 69)



STABILIZER & RUDDER MOUNTING

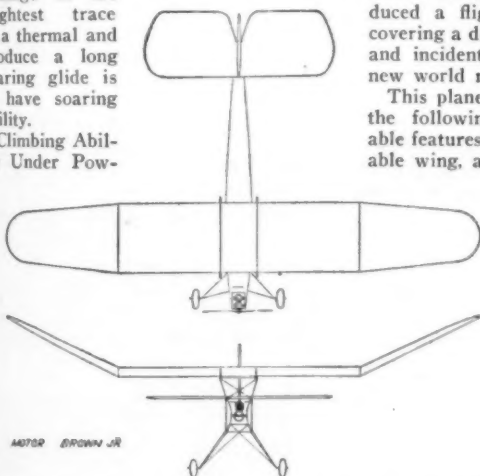
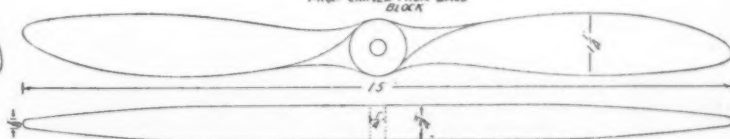


MOUNT COIL & CONDENSER ON No. 1 BULKHEAD

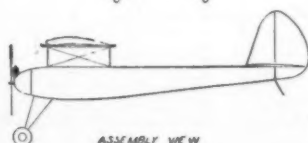


WIRING DIAGRAM

PROP CARVED FROM BASS BLOCK



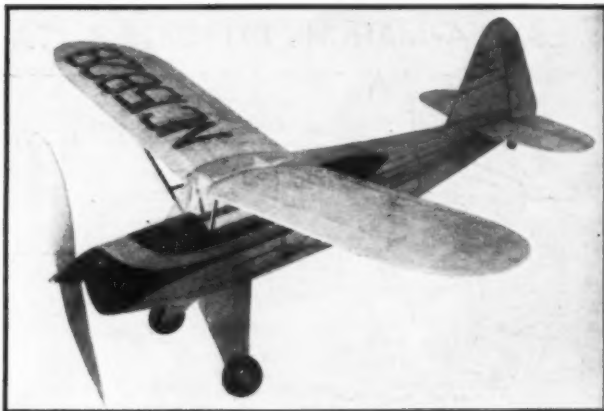
MOTOR BROWN JR



ASSEMBLY VIEW

Air Ways

What Readers Are Doing to Increase
Their Knowledge of Aviation in All
Parts of the World



Pict. No. 1. A perfect flying scale model by Earl Stahl



Pict. No. 2. What every home should have

Airways Club News

AIRWAYS Club members have been extremely busy since the advent of fine weather—at least they have come out into the open where the products of their hours of labor may be seen. Some very fine specimens of aircraft have come to us this month.

Earl Stahl of 810 Suter Street, Johnstown, Pa., captures the place of honor with picture No. 1, showing his flying scale Rearwin Speedster. It is a fine piece of work and the flights of the ship do not belie the effort displayed. It flies for 1 1/2 minutes; has a span of 30 inches and weighs 2 1/2 ounces with 12 strands of 1 1/2" rubber. We are going to try to get Earl to supply plans of this model for publication in *MODEL AIRPLANE NEWS*.

Picture No. 2 shows one of our old friends, Ed Sengwoda of 1940 Macdonald Avenue, Brandon, Manitoba, Canada, in the midst of some serious business. This is a corner of his workshop, as you can probably see, and in it is included a little bit of everything from cement, balsa wood, etc. to copies of *MODEL AIRPLANE NEWS*. In his letter to us Ed says:

"Ever since I started building I have wanted to see what the atmosphere in a typical model builder's room looked like. I made up my mind that some day I'd have one of these 'dirty rooms' and that I would record it for other fellows that like looking at black molecules. That day came a few months ago. Before taking the pictures we outlined a few things which should be included—here is what we got:

"A lot of neatly arranged debris; A likewise model-butcher (yours truly); Strictly aeronautical scenery; A little air and lights for a change; A plug for the magazine it was being especially made for.

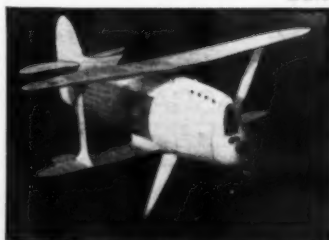
"After scraping up enough dough for wire, hooks, tripod, cable-release, sockets, reflectors and flash bulbs and some fast film this is what we got. It was a 'direct result' and we sure fulfilled the 'mess' part all right!"

Ed finishes off his discourse by saying that he sleeps in here 365 days of a year. Apparently there seems to be an error: We never knew that model builders ever slept! Perhaps Ed absorbs some of the aeronautical atmosphere through his proximity to it while he sleeps.

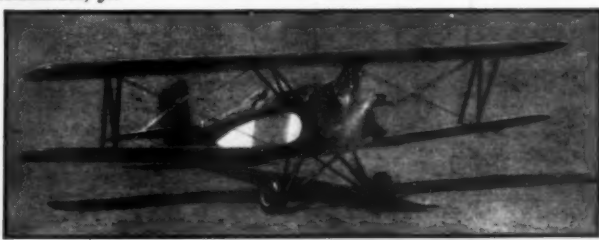
Picture No. 3 shows
(Continued on page 60)



Pict. No. 8 and No. 9. The plane that wins this month's Originality Design contest; by David Alexander, Jr.



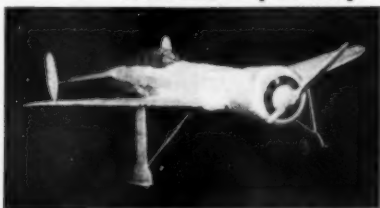
Pict. No. 3. A well designed biplane by Norris Malpby. Note wide "gap"



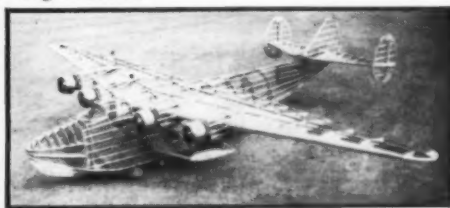
Pict. No. 4. A solid scale model of a Fleet trainer by Stanley Orzeck. It includes complete cockpit and engine details



Pict. No. 7. An 8 1/2 oz. duration job by one of our British friends

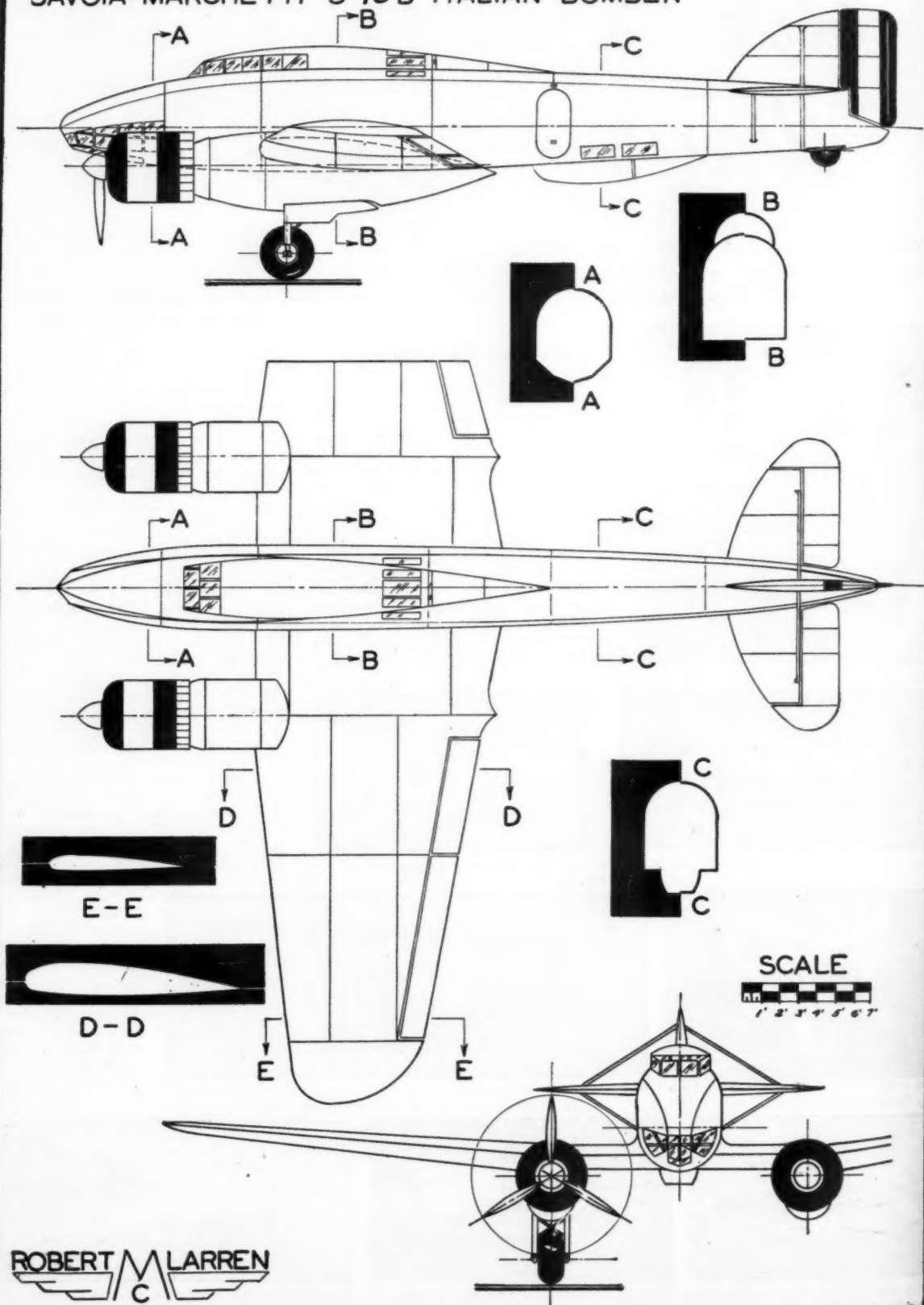


Pict. No. 5. David Alexander Jr.'s idea of what a modern fighter should be like



Pict. No. 6. Joe Oliver has made a beautiful job of constructing this Boeing Clipper 314

SAVOIA-MARCHETTI S-79 B ITALIAN BOMBER



Eagle of Il Duce

The Plane On the Cover

ORDEAL by fire, the flaming and torturous expanse of the vast Libyan Desert, is the badge of service worn by our Plane on the Cover this month, the Savoia-Marchetti S-79B Italian Bomber. For it was its older brother, the swift and deadly S-79 tri-motor monster of destruction, that blasted obstinate war-weary Abyssinians out of hidden recesses investing the rock-strewn plateau of history's oldest modern nation, now only a healing wound in the escutcheon of the visionary League of Nations. No man-made testing ground could subject a ship to a more grueling punishment and this later and more modern adaption of the terrorizing "El Habarra," as the negroes called the S-79, is the culmination of "proven in practice" airplane design by one of the world's oldest aircraft firms. Founded in 1915, the Societa Italiana Aeroplani Idrovolanti "Savoia-Marchetti" has progressed inexorably towards a perfection in practical aerodynamic design and within its voluminous files are the records of an hundred or more successful models, both

By
**ROBERT
McLARREN**

biplane and monoplane, single-engine and multi-motored, landplane and seaplane, all inspired by Italy's foremost aeronautical genius, G. Uff. Ing. Alessandro Marchetti, the firm's Chief Engineer.

Basically a cleaned-up version of the SM-79 with the nose engine replaced by a gunner's quarters, the SM-79B Heavy Bomber is a cantilever, twin-engine, high-performance monoplane of composite con-



Nose of the Savoia Marchetti S-79B showing aiming window



The S-79B warms up for a bombing mission

struction. The single cantilever wing is built in one piece on a structure of three double "T"-section spars, solid plywood compression ribs, a plywood outer skin, the entire structure covered with doped fabric. This type construction insures a far greater accuracy in the preservation of the true airfoil section in assembly than that obtained by dural and alclad covered wings which ripple and blister under the

pressure of the rivet hammer. Oddly enough, the wing is divided into a series of water-tight compartments. The entire trailing edge of the wing is hinged, the outer portion serving as ailerons and the inner section hinging downward as landing flaps. The outer portion of the leading edge is equipped with Handley-Page slots. The ailerons are statically balanced by the

(Continued on page 30)

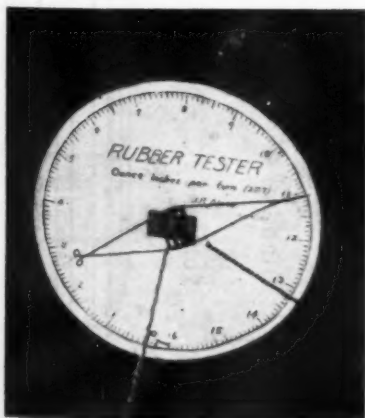
How You Can Determine the Flight Duration of Your Model By Simple Formulae

ALL model builders have their own ideas on how to get the greatest endurance from their planes, but few can predict the performance of their models by any logical theory.

If the class will come to order, the

By
**W. HEWITT
PHILLIPS**

HOW LONG *will it fly*?



A rubber motor torque tester

prof will present a theory worked out by John P. Glass and other Boston model builders, whereby it is possible to determine exactly how certain design characteristics of rubber-powered models affect their endurance.

Let's use an analogy to help clarify the basis of this method for determining duration. If a child has thirty boxes of candy and consumes them at the constant rate of three a day, the supply lasts for ten days; the result may be obtained by dividing the total amount by the rate or consulting the nearest doctor. Similar reasoning says the endurance of a model plane equals the total amount of work stored in the rubber, divided by the rate at which work is used up in flying the model.

Since rate of doing work is defined as power, we can state that the endurance

equals the total work stored in the rubber divided by the power required to fly the model.

The case of the plane differs only from the example given in that the model does not use up work at a constant rate. At the start of the flight the rubber is tightly wound and delivers work at a much higher rate than at the end. The work used in flying a model may, however, be divided into two parts; that used in lifting the weight of the ship against the force of gravity and that used in churning up the air, or overcoming drag. If the model lands at the same altitude at which it is launched, the net amount of work done against gravity is zero, because any work done in lifting the model is returned to it again as it descends.

Provided the adjustment of the model

(Continued on page 28)



Scale - $\frac{1}{4}$ " = 1" (except where noted otherwise).

Designed by: Conrad Renning

Area - 122 sq. in.

Req'd Wt. - 3.66 oz.

Power - 12 Strands

3 7/16" Brown Rubber.

Stick length 34"

FUSELAGE SECTIONS

A·A B·B C·C

6

4

1

10

1

1

PROP-1 $\frac{1}{2}$ "x1 $\frac{3}{4}$ "x16"

Dihedral 4°

former

2

4

1

1

1

1

1

1

1

A Winning Stick Tractor

How You Can Build and Fly a Model of Unusual Type With a Contest Winning Performance

By CONRAD RENNING

IN RECENT years the tendency in model design has been toward a high rate of climb with a short motor run. However the author, among others, has adhered to the policy of medium rate of climb with an extended motor run. The model of which plans are presented here is an example of the latter and has proved very consistent in contest work. The design is the result of several years of experimenting by the author and in 1935 the author made a flight of 34 minutes with a model similar to the one shown. While the power may seem small the original model flew well under all weather conditions.

Fuselage

The triangular cross section of the stick makes construction comparatively easy, and the author has found that an easy method of construction is to lay out the top of the framework first. Leaving this part on the work board you add the up-rights and the bottom longeron. After the framework has dried remove it from the board and add formers and stringers as indicated on the plan. The tailboom is cut off at the point indicated on the plan. The rear plug is a piece of 1/4" balsa cut to fit snugly inside the rear end of the stick and is glued to the tailboom with 1/8" protruding. The rear hook is made of 1/16" wire anchored securely to the rear plug.

Wing

Using the airfoil shown on the plans cut 23 ribs from 1/20" medium grade "C" stock. Pin the trailing edge in place and

add ribs and leading edge, glueing all joints well. When dry remove from the plans and add bamboo tips. Crack the leading and trailing edge at the center. Raise each tip four inches for dihedral and apply glue generously at center. Add the main spar and set the wing aside to dry.

Tail

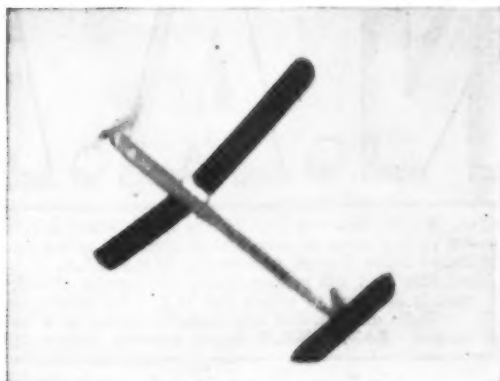
The construction of the stabilizer is the



The author and the high performance model which placed among the winners at many contests

same as the construction of the wing, with the exception that the stabilizer rib is used and no dihedral is added.

The rudder construction is the same as that of the stabilizer. The same



Up she goes in a steady long climb

airfoil is used with the convex side on the right when facing the model.

Propeller and Nose Plug

The prop is carved from a block of medium hard balsa 1-1/2" x 1-3/4" x 16". In blanking out the prop cut away the shaded portions only. Then proceed to carve the prop in the usual manner. As a final step sand the blades smooth and add several coats of dope, sanding lightly between each coat. Any one of the popular types of free wheeling devices may be used.

The nose plug is carved to shape from a block of balsa. As the correct amount of right and "down thrust" can only be determined by testing, no definite amount is specified. The prop shaft is made from 1/16" piano wire. The hook is covered with rubber tubing to protect the motor.

The wing mount is carved from a block of balsa 1" x 1-1/2" x 3-1/2" and glued to wing. It is held in place on the fuselage by rubber bands.

Covering

The original model was covered with red tissue and was water-doped and treated with two coats of clear dope.

Flying

The motor is composed of twelve strands of 3/16" brown rubber, 36" long. After obtaining a flat glide all adjustments should be made by altering the thrust line. The original model flew in right circles under power and in the glide.

Well, go to it. Best of luck.

HAVE YOU DISCOVERED CRINOLINE?

By ELBERT J. WEATHERS

THIS article has been written to advise the gas model fraternity of the many virtues which come from the use of crinoline in gas model construction.

What is crinoline? Almost any woman can tell you, as it is widely used in connection with dressmaking. It looks like starched cheesecloth, and as far as is known, it was first used for gas models by a San Diego gas model enthusiast who introduced it to the writer and who in turn now passes it on to all gas jobbers who are looking for the ultimate in

strength in turning out their ships.

Crinoline, when used to cover nose blocks, wing spars, wing trailing edges, etc., makes such parts extremely strong. It has the quality of working exceedingly well over compound curves, such as found on a nose block. A piece can be applied over such a curve so that it contracts or expands in any direction as required.

To apply it, use model cement of rather thick consistency. Spread the cement over the wood and lay on the crinoline, rubbing it out flat. Go over the outside of it with cement on the finger, spreading

(Continued on page 54)



A high aspect ratio and a long motor run provide excellent duration qualities

N.A.A. OFFICIAL MODEL AIRPLANE NEWS

BY THE time you read this the N.A.A. Model Division will have ready for distribution a printed announcement setting forth the various types of membership available to individuals and clubs interested in furthering model aviation advancement in the United States through membership in the N.A.A.

This form will present briefly the benefits of such membership and explain the various membership fees. The entire announcement is designed to enable you to find the information you want in a moment.

Clubs and builders are cordially invited to write for this helpful explanatory bulletin. Please include a 3c stamp with your request. Address N.A.A. Model Division, Dupont Circle, Washington, D.C.

Membership Forms For Affiliated Clubs

MODEL airplane clubs who have signed "affiliation" membership papers with the Model Division of the National Aeronautic Association will be interested in learning that a supply of "membership" forms is now available on request from Washington headquarters, which will permit such club members to compete in "out-of-town" rubber-model meets.

This form certifies that the person presenting it is a member in good standing of the "affiliated" club and as such is eligible to compete in all N.A.A. sanctioned rubber meets, providing such competitions are open to all N.A.A.'ers and not restricted to members of the sponsoring group.

This privilege is granted to affiliated clubs and is in addition to the right granted to print on club membership cards the words "affiliated with the National Aeronautic Association." Such a card, or this new form, will provide the proper credentials for entering "invitation" rubber battles.

Macfadden Sponsors Wakefield

Bernarr Macfadden, patron and friend of so many aviation movements, has moved to finance the annual Lord Wakefield International Model Aircraft Competition which will be held in August 6 at the Aviation Country Club, Hicksville, N.Y. Also associated in the "running off" of this world-famous event will be the New York World's Fair and the Greater New York Chapter of the N.A.A.

Contesting teams from England, France, Canada, Denmark and Italy are expected to compete. A dozen other countries will be represented by "proxy" flyers.

Macfadden's plans include a cash award to the winning team of \$250 as well as a plaque or medal presentation to each contestant attending the meet. Foreign guests and men prominent in the "youth-in-aviation" field in the country will be entertained by Mr. Macfadden at a dinner in New York. His contribution includes the ex-



The winning design of the 1939 National Championship Model Airplane Meet insignia contest. This is the second successive year that H. A. Thomas, its creator, has won.

pense of putting on the competition at the Aviation Country Club and luncheons for the contestants and other expenses,

including transportation of foreign visitors while they are in New York.

Mr. Macfadden's participation takes a heavy load from the shoulders of the various model groups who are endeavoring to represent the United States in this most famous of all model aircraft meets.

West Coast Wakefield Elimination Meet Held on Independence Day

John Bunch, director of the representative West Coast Meet held for the benefit of West Coast Wakefield enthusiasts unable to attend the eliminations at Detroit, announced that this contest was scheduled to have been held at Van Nuys, Calif., on July 4, 1939.

Four of the American Wakefield Team of six representing the U. S. at the International Meet in New York, August 6, were to have been selected at the eliminations held in connection with the National Meet in Detroit, July 5 to 9 inclusive. The sixth place has been reserved for the winner of the representative West Coast Wakefield Meet.

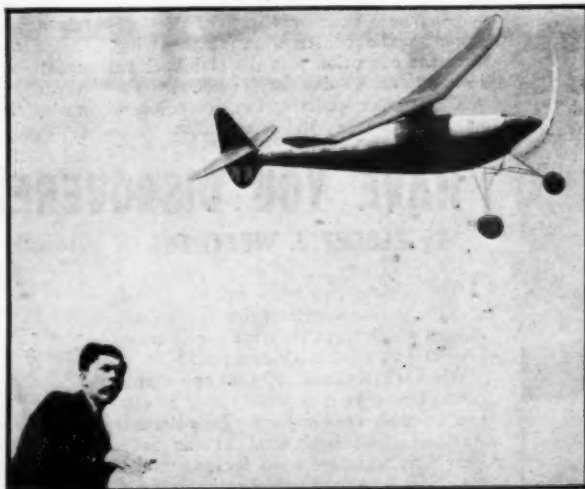
James Cahill, of Indianapolis, last year's Wakefield winner, and the fellow who brought the "old mug" back to the United States, automatically is awarded a place on the 1939 American team through his "win" of last Summer.

Three-Flight-Average Ruling of Academy Receives Warm Response

Through its Washington, D.C., headquarters representatives, the N.A.A. Academy of Model Aeronautics issues the following statement concerning its new ruling which calls for a "three-flight-average" compilation of duration times for meet and record purposes.

The Academy is happy to announce that this rule which tends to eliminate the "luck" element in modelplane competition, has met with widespread approval, even in the indoor field, where a few felt it was not quite so well adapted. However, the number of enthusiastic messages warmly applauding the move shows beyond a doubt that the Academy was representing nation-wide

(Continued on page 48)



A picture showing an English Wakefield Contest contender tuning up his plane. And "what do you think?" The plane is an American-designed craft, built from plans appearing in M.A.N.I.

GAS LINES

Official Section of the National Aeronautic Association Gas Model Division

I.G.M.A.A. News. All Clubs Are Eligible to Join As Units. Join Now!

THE 1939 Nationals are here!! Those who are fortunate enough to be able to attend will have the thrill of probably seeing many of the planes pictured on these pages in "all their glory." As far as model builders are concerned, it is unfortunate that everyone cannot be on hand to visualize the strides made in gas model design since the last national "brawl." However, in other respects it is very fortunate for the city of Detroit and the contest officials that all of the 300,000 to 500,000 model builders cannot be on hand. We are wondering just what would happen provided the majority of model enthusiasts suddenly took it into their heads to journey to Detroit. Perhaps it is a good thing that there is a depression or such a thing might happen. In spite of the difficulties involved we are hoping that such a model aviation migration might sometime take place.

We will now try to give you a little preview and description of the planes which appear here, so that you can more fully picture their participation in the great annual contest.

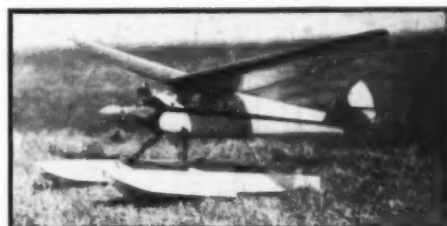
Picture No. 1 is one of the finest planes, from a design standpoint, that has come to our attention. It is a five foot span, Brown powered, 2 pounds, 4 ounces model, built by Paul Plecan of 100 E. 10th Street, New York City. It has a wing loading of 8.5 ounces per square foot. Some of the fine points of its design are:

A wing of beautiful shape and high efficiency; a large lifting tail which, though not

counted as wing area, helps to support the weight of the model; twin rudders which have proven to be a deterrent against spinning and which not only increase the efficiency of the stabilizer but promote stability; a one wheel landing gear which reduces resistance to a minimum (This in connection with the fins enables the plane to take off unaided by the model pilot), a high line of thrust which increases the longitudinal stabil-

ity of the ship and allows the center of gravity to be placed close to the center of lateral area (This promotes spiral stability). A bellied down fuselage also
(Continued on page 54)

Pict. No. 1. A ship of great flight capacity, by Paul Plecan



Pict. No. 2. A hydro that weighs only 28½ oz. complete: A beautiful flier by E. P. Lott



Pict. No. 3 and No. 4. A plane with one of the first reliable retractable landing gears



Pict. No. 6. A new experimental plane with a high lift airfoil, the Grant M-7, at 6 degrees. By Elbert Weathers



Pict. No. 5. Believe it or not, this biplane is a gas model by Chas. Gruber



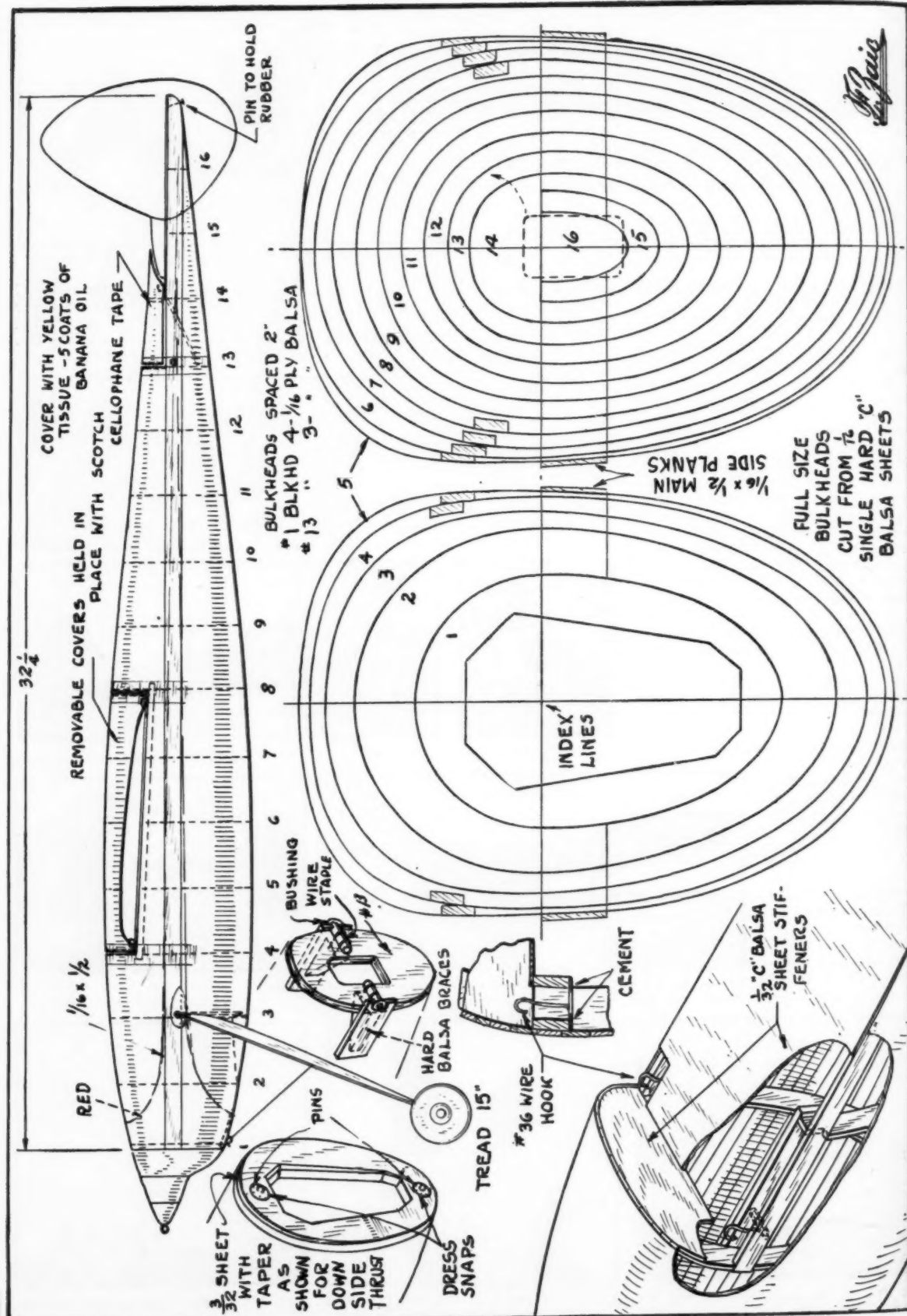
Pict. No. 7. Murray Whitner and his Sinson flown at the East Paterson contest



Pict. No. 8. Sal Taibi who won first place with the Class A model he is holding



Pict. No. 9. Frank Ehling with the same old smile but with a new freak gas job



What To Build For The Wakefield



The author with the finished model

THIS model was designed and built with the intention of having a plane that would give better results in calm air or air in which there are few if any rising air currents, than an ordinary outdoor model. Using sixteen to twenty strands of rubber (depending on the air conditions) and using a nineteen inch propeller on the maximum amount of winds, it had a prop run of approximately two minutes.

Shortly after returning from the "Nationals" we were asked to enter a model in the Wakefield International Contest.

Having but two weeks to build a model and get it ready for shipping, we decided to use the same type model that we used in the Moffett Contest. After eight days it was completed and test flown on two separate evenings for adjustments. When the model was properly adjusted, with the aid of several members of the Brookside Club of Indianapolis acting as timers, we tried three flights to check the consistency of the model.

The first flight was started shortly before dark with practically no wind blowing, and the model stayed up for 2 min., 35 sec. The last two flights were flown in the moonlight and although a trifle

**An Efficient Fine Flying Plane
That Conforms to the Wakefield
Rules—Designed By an Old Master**

By FRANK ZAIC

difficult to see we managed to follow it to the end of the flights, as it didn't cover very much distance. Each flight was for the same duration of 2 min., 35 sec.

The model was christened "The Groundhugger," a name which it lived up to, for in the Wakefield Contest the plane made an average duration of two minutes and sixteen seconds, which won it fourth place.

The methods followed in constructing it were as follows:

Fuselage

Past experience dictated all balsa construction, but past work held memories of long hours struggling with balky balsa sheets. So, taking a hint from the gas job boys the fuselage was planked. The method of plotting the bulkheads is similar to that used on boats. You will notice that bulkhead No. 5 is the largest and since the wing is almost a mid-wing, it

would be rather useless to carry out the ellipse above the wing as the air is more or less messed up at this junction. A close approach to a square would help with the area. The point is to make the bulkhead contain as much as possible of cross section area without bulkiness.

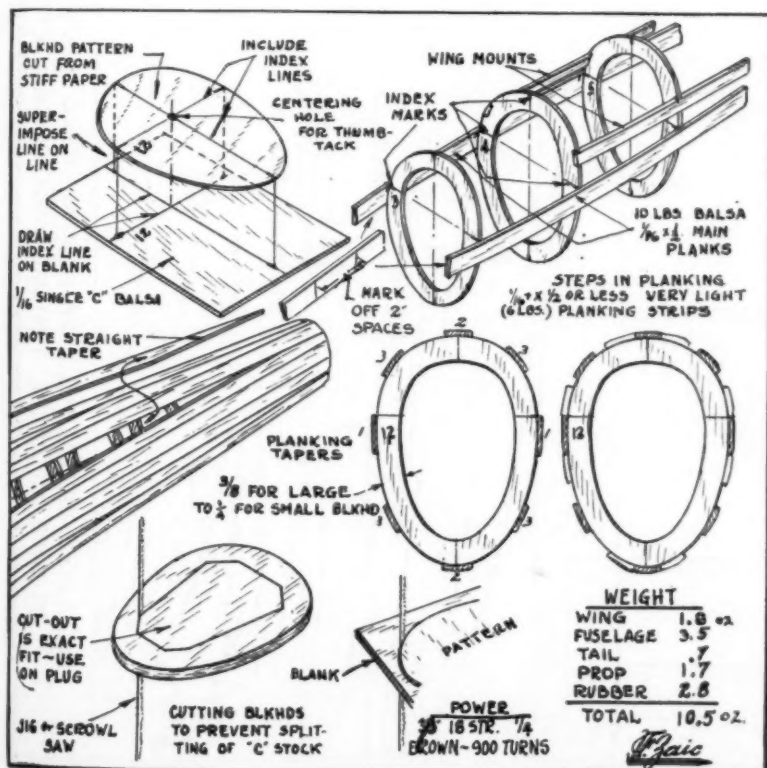
Now that we have the largest bulkhead we plot the rest by superimposing the front bulkhead over it and draw the rest in front to produce smooth contour. The same idea applies to bulkheads behind No. 5. The exact sizes of major and minor axis can be more readily determined by drawing a side and plan view of the fuselage. This hint is given to those who have their own pet fuselage outlines which they would like to develop. For duplication of the "New Yorker III" the given full size bulkheads were drawn directly from the paper patterns.

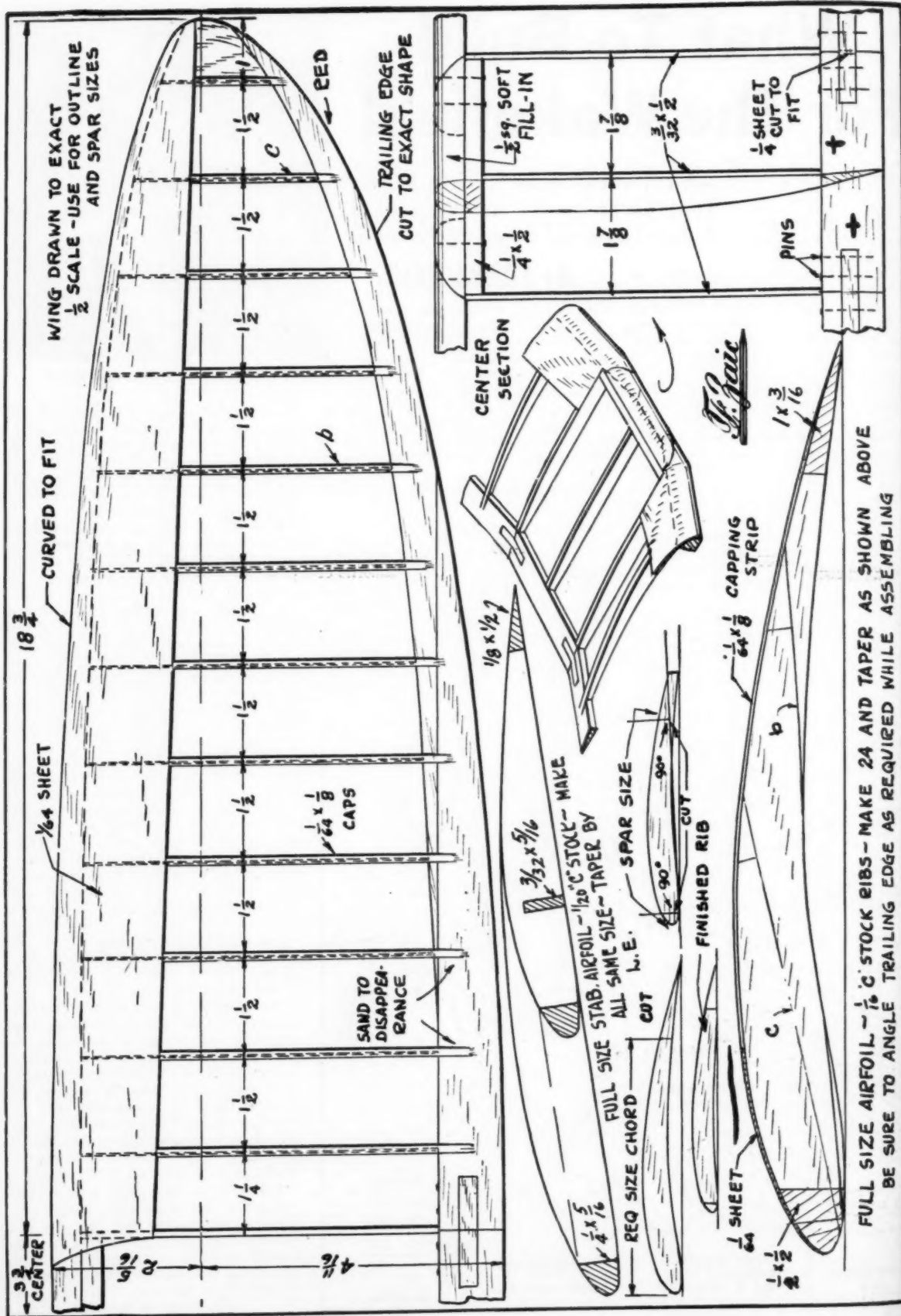
The bulkhead patterns are made by transferring the outlines on the drawings to the individual stiff paper outlines by pin points or carbon paper. The main thought to keep in mind is to be sure of the side planks index marks. The bulkheads are cut from single sheet quarter-grained or "C" balsa. Superimpose the pattern over the sheet and hold it firmly in place with thumbtacks while trimming the outline with a fine toothed saw. A razor gives angled or rough cuts. Be sure to use the quarter-grained balsa as it is very stiff although it splits when forced into a bend.

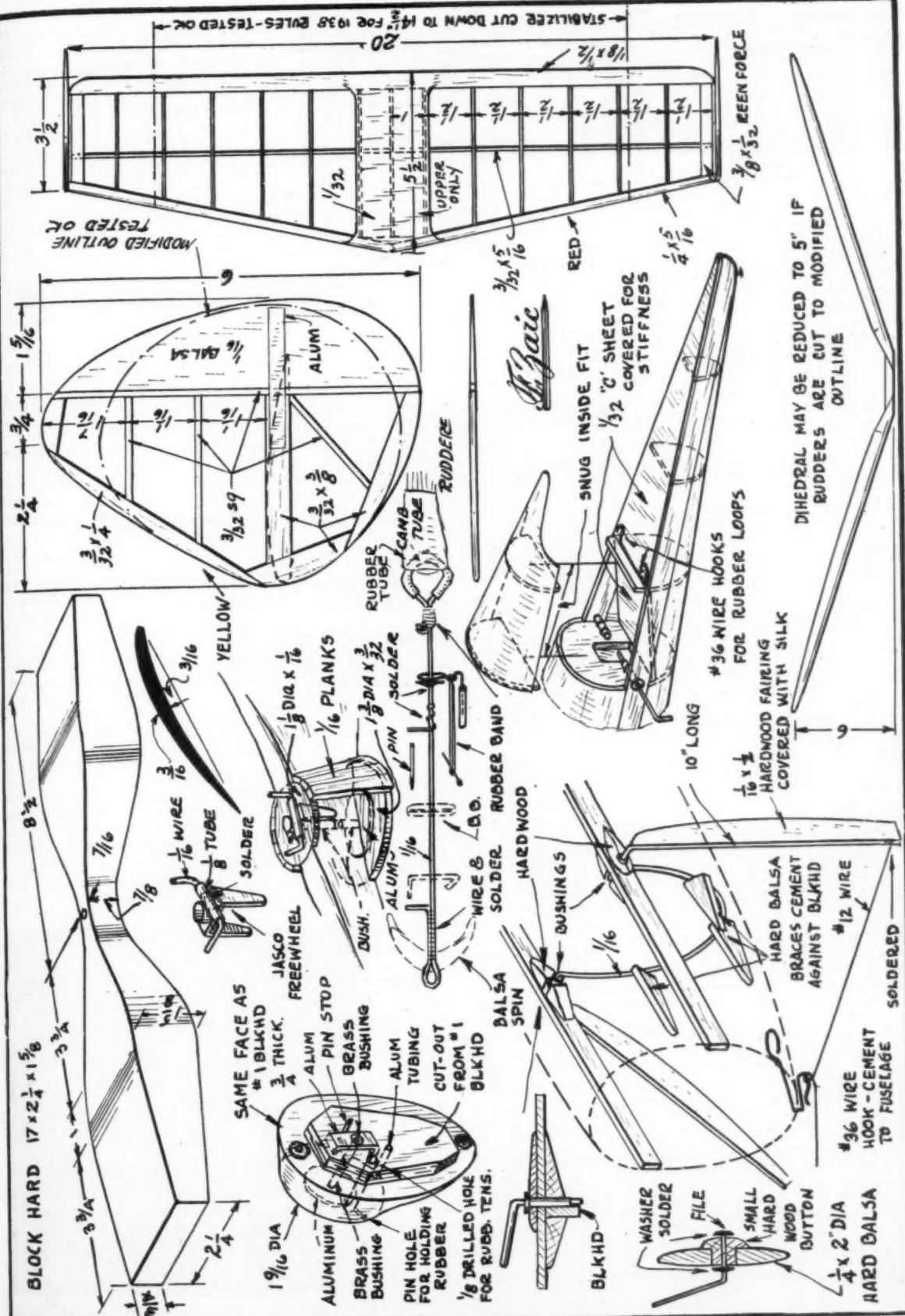
The entire job is built in the air by first cementing all the bulkheads, starting from the center outward, to the two main side planks. If the patterns are carefully made, the side planks subdivided into two-inch spaces and carefully aligned, no trouble should be experienced with the fuselage. Once the side planks are in place the remaining planks can be cemented in almost any fashion as long as balance of planks is kept even on both sides.

Before the lower portion is completely planked be sure to place the landing gear wires in place. Note that they are just underneath the half planks. It is very important that the bushings are held in place with hardwood fillets as balsa just "squashes" in landings. Since the fuse-

(Continued on page 38)







FLASH-NEWS

SPECIAL TO MODEL AIRPLANE NEWS:

ONE of the most efficient two engine airplanes that has ever flown has just been turned out by a firm in England. This is the first plane and is purely experimental; however the performance has been phenomenal. It is a British development of the Burnelli Model UB-14 which is being built on a patent license by the Cunliffe-Owen Aircraft Limited of Southampton, England. During January they completed a new plant which rates as one of the best in England, located at the Southampton Airport.

The original UB-14 which was built in 1935 had been extensively demonstrated in this country by Mr. Clyde Pangborn and other noted pilots. Mr. Pangborn had employed the plane on a demonstration trip in Europe and official tests conducted in England brought about the manufacturing program that is now underway for the Burnelli lifting fuselage plane. Incidentally this is the only large American design of the many negotiated there that has actually been put into manufacture.

The performance of this plane is outstanding in that the percentage of disposable load is 50% of the gross weight. The empty weight is 9,500 lbs. and the gross weight 19,000 lbs. On official tests the airplane climbed 10,000 feet in 12 minutes and maintained altitude on one motor at 75% throttle. High speed at sea level 237 m.p.h. and 203 m.p.h. cruising speed.

Sir Hugo Cunliffe-Owen, who is head of this organization, is one of the leading industrialists of the British Empire and is Chairman of the Board of the British-American Tobacco Company, and also controls the largest Airway System operating within the British Isles.

As the British machine has been constructed on the basis of Air Ministry approval, production jigs and fixtures have been prepared for the manufacture of the type. The airplane is equipped with two Bristol Perseus sleeve valve engines and are the first to be installed in a commercial airplane in England.

Ordered by the United States Army Air Corps: 150 Douglas DB-7 twin-engine light bombers at a cost of \$15,000,000; 7 Martin attack-bombers at a cost of \$500,000; 7 Stearman X-100 attack-bombers at a cost of \$500,000, and 13 Seversky XP-41 Fighters at a cost of \$974,324.

To Germany: one of the most important air bases in South America in Trinidad on the Mamore River, one of the headwaters of the Amazon. Huge hangers and facilities already a-building.

Lewis A. Yancey and Russel Rogers, famed American airmen, on a five thousand mile Australia-Africa survey flight. The ship: Consolidated "Guba."

German losses in Spain: 344 battle planes, 580 men killed, 1100 seriously injured. Spanish losses to Germany: a third that figure!

Donald Douglas celebrated 25th year in aviation; his XB-23 will be astounding



The new British-built Burnelli type twin engine bomber. It carries a disposable load equal to its own weight; 9500 pounds. It climbs 10,000 feet in 12 minutes and can fly at the rate of 237 m.p.h.

when it flies early in July, powered by 1600-hp. Twin Cyclones! Two-hundredth DC-3 christened at the party. Six hundred Douglas ship promised by 1940.

Five "Stratoliners" completed, none flown; C.A.A. still holding decision on crash, result: no flight dates. T.W.A. is getting them.

Chester L. Tobias, of Air Corps' Wright Field motion-picture staff in Hollywood getting low-down on precision film work at Chief H. H. Arnold's request.

First complete Federal testing station for safety devices used in commercial aviation opened in Indianapolis. Transmitters, receivers, blind landing equipment, radio beams, compasses, airport lights, etc., will be tested.

West Coast Development Company constructing airplane plant at busy Los Angeles Municipal Airport. Commercial and military craft to be built.

Helium in five-hundred-thousand cubic feet lots now available for export. Poland will get hers for balloon, Germany scoffs but needs three million for LZ-130.

Over and Back: The huge Lieutenant De Vaisseau Paris, six-engine Latécoere flying boat on round trip from Bordeaux (France) to Port Washington (U.S.A.) completed without mishap. Ship lay a week in Pensacola Bay two years ago.

Mailbox wing-tip slots on American Airlines' new DC-3 Airliners.

N.A. BT-9 cruised through two 18-inch brick walls and wrecked offices and archives containing photographic plates and other records it took 30 years to collect at San Jose (California's) Lick Astronomical Observatory. Pilot and passenger beyond recognition.

Laura Ingalls' record hop (*Flash News*, MODEL AIRPLANE NEWS, July, 1939) delayed when sleek Barkley-Grow nosed over at home (Detroit) port. Repairs and take-off scheduled immediately.

Seven DC-4's to United Airlines added to Douglas' present order for four from K.L.M. Cost: \$450,000 per each! With Benny Howard and the Mrs. at the controls the monster recently hauled 44 passengers and crew of six aloft, including Tyrone and Annabella, the most ever by a landplane in America!

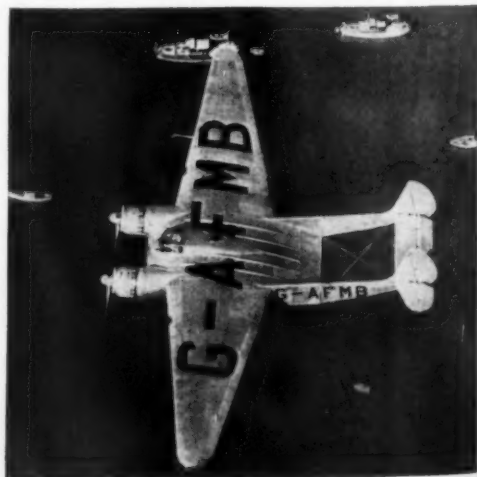
California, with its 4,409 licensed air pilots, has more than twice that of New York, next in rank, and one-sixth of the 24,143 pilots in the U.S.

Paul Mantz, now flying famous Travelair "Mystery Ship," which won the Thompson Trophy in 1929, as a stunt plane.

Is the rumor true that TWA and American Export Airlines will merge soon?

Dead: Lady Mary Heath, British aviatrix, first woman commercial airline pilot; Capt. Francisco Sarabia, premier Mexican pilot and record-breaker; Thomas H. Smith, 90 horsepower vs. the Atlantic which won; Charles Backman, ditto.

An American Gibraltar in Puerto Rico (Continued on page 37)



The long center section of the wing serves as the fuselage. A "blister" houses the crew

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WHY are Bunch Engines being chosen by those best qualified by experience to select the *best* motors?

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Mighty Midget Upright Kit.....	7.85	<input type="checkbox"/>
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Speedway Race Car Engine.....	14.00	<input type="checkbox"/>
Speedway Engine Kit.....	11.85	<input type="checkbox"/>

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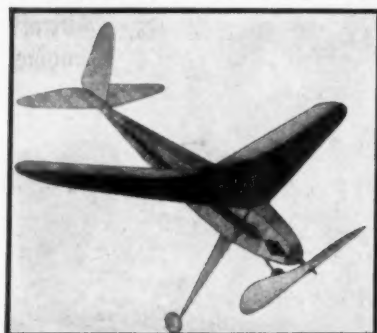
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Fundamentals of Model Plane Design

(Continued from page 10)

the airplane will rise. A derrick could perform this function, but such a device would limit the scope of so-called "flight." Obviously the plane must be suspended in the air, free from any physical contact with the ground, other than the air. Thus we see that air itself must do all the lifting. It must generate a force that will overcome the pull of gravity and which will be greater than the weight of the plane. Some part of the "flying machine" must act on the air in such a manner that lift will be generated.

We may say, then, that the first and most important factor that an airplane should have is A MEANS OF LIFT. In the case of an airplane, the wings serve the purpose of lifting.

Factor No. 2—A Means of Propulsion

Obviously there is no point in having the airplane lift from the ground if it cannot go somewhere; travel from one place to another. Therefore another device is required on our plane. There must be some means of driving or propelling the plane through the air—something that will create a force acting in a horizontal plane. (The wings generate the required vertical force.) The propulsive horizontal force overcomes the resistance produced by the action of the air on the airplane, as the structure of the craft moves through the air.

The propulsive force also has another function besides taking the craft from one place to another. It causes the wings to lift by moving them through the air. Thus it may be seen that the propulsive force is a function of the lift and a very necessary factor of flight. Therefore an airplane must have some device that will drive it through the air; a MEANS OF PROPULSION. The propeller serves this purpose on an airplane.

Factor No. 3—A Source of Power

In order to create the propulsive force power must be expended and thus some means of generating power must be incorporated in the flying craft. This power must be transmitted to the means of propulsion in order to have the latter generate the propelling force.

Rubber band motors or small gasoline engines are used usually as a source of power for model planes. Compressed air engines are used occasionally but these have not proved to be as satisfactory as other forms of power plants.

Factor No. 4—A Means of Stabilizing the Plane

An airplane is supported by the air, a medium which is not rigid and which is in more or less constant motion. Therefore its flight course and attitude is bound to be affected by this condition. Some means of overcoming or correcting the disturbing effect of changes in air pressure reactions on the plane must be supplied. It must prevent the craft from being driven from the desired course of flight and true flight attitude or it must return the airplane to normal flight balance and direction without delay. Thus A MEANS OF STABILITY

must be embodied in the plane. As many model plane fliers already know, this is the most important factor of all, for unless a plane can remain "upright" in flight all the lifting and driving power in the world is useless.

No single device or part of a plane provides stability. This is created in a model by the inter-reactions of the various forces involved and parts of the plane. The proportion, shape and relative position of the essential parts of an airplane affect the direction and magnitude of the forces. Therefore the proportions of a plane determine the character and amount of stability it will display.

Factor No. 5—A Means of Landing

So far in our reasoning we have been able to get our airplane off the ground, move it from one place to another through the air and keep it "upright" in true flight position. However, a moment comes finally when the plane must return to earth. It must "land" and come to rest without damage. Thus A MEANS OF LANDING the plane is essential. Some device must be incorporated in the plane's structure that will enable it to contact and rest upon the ground. This is our fifth factor of flight.

Factor No. 6—The Framework

The sixth required factor is a structural one; a means of holding all the essential units of the airplane in correct relative position. The framework of the airplane serves this purpose. It must be built strong enough to withstand all the stresses of flight and shaped so it will give minimum resistance to forward motion.

No basic factors other than the six included here are required. The next step in the problem of design is to determine their correct relative size, shape and position. When these are known, it will be possible to build an airplane that will fly.

(Article No. 2 will appear in the Sept. 1939 issue.)

How Long Will It Fly?

(Continued from page 17)

remains the same during the entire flight, the power used in overcoming drag does remain constant. In other words, if the angle of attack of the model is the same throughout the flight, the power used in overcoming drag does not change. Since this is the ideal condition for a well-adjusted indoor model, it is a good assumption on which to base the prof's theory.

Summarizing in formula style what has transpired so far:

$$\text{Endurance (in seconds)} = \frac{\text{total work}}{\text{work used per second}} = \frac{\text{total work}}{(\text{work against gravity} + \text{work against drag}) \text{ per second.}}$$

But since the entire flight work against gravity equals zero, therefore:

$$\text{Endurance} = \frac{\text{total work}}{\text{work against drag per second.}}$$

So now we have a formula, though it's useless as it stands. But if it is possible

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STANDARD KIT same, but with bamboo paper covering.....2.95

DRY KIT complete except for wheels, covering, cement and dope.....1.95

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1939 PACIFIC ACE GAS MODEL

66 in. tapered wing. *DE LUXE KIT* contains tapered spars, beveled and tapered trailing edge, die-cut ribs, turned aluminum cowl, 1 qt. gas dope, 1 pt. cement, 3 1/2 yds. super silk, formed landing gear, 4 1/2 in. inflatable air wheels, dural wire, alum. tube, washers, bolts, haskelite, dural sheet, hook up wire, switch, selected hard balsa, full sized, black and white, plans with test flight instructions, complete.....\$8.50

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to express its quantities in terms of design features of the model, it'll provide a means of computing endurance. So here we go, hang on:

The amount of work which can be stored in a rubber motor has been found by means of torque tests to depend *only* on the weight of the rubber. The same amount of work can be stored in a 20-inch loop of 1/16-inch rubber as in a 10-inch loop of 1/8-inch rubber. The amount of work which can be delivered by "brown" rubber under ideal conditions was found by J. P. (as John P. Glass is known to his associates) to be 30,000 inch ounces per ounce of rubber.

This means that the rubber, if placed in a mythical 100%-efficient helicopter which weighed nothing, would lift itself 30,000 inches, or about half a mile.

The amount of work available to fly any model equals 30,000 multiplied by W_r inch ounces, where W_r equals the weight of the rubber in ounces. The professor'll admit not all the work delivered by the rubber goes into flying the model, however. Part of it is wasted because of propeller inefficiency.

Where N is the efficiency of the propeller, $30,000 \times W_r \times N$ equals the work actually used in flying a model. Now the formula can stand as:

$$\text{Endurance} = \frac{\text{total work}}{\text{work against drag per second.}} \\ = \frac{30,000 \times W_r \times N}{\text{work against drag per second.}}$$

Next step is to find an expression for work against drag per second. It's easy—when a model is gliding, all the work used in overcoming drag comes from gravity, and the work done per second equals the total weight of the model multiplied by the sinking speed in inches per second.

Already it has been shown that if the angle of attack is constant, this quantity is the same whether the model is climbing, flying level or gliding. Therefore we may substitute in the formula:

$$\text{Endurance} = \frac{30,000 \times W_r \times N}{\text{work against drag per second}} = \frac{30,000 \times W_r \times N}{W_t = V_s}$$

where W_t stands for total weight of model in ounces, V_s stands for sinking speed in inches per second and N = the efficiency of the propeller in per cent.

This formula provides a convenient method for computing the theoretical endurance of any model. The weight of rubber and the total weight are easily measured. The sinking speed may be determined by gliding the model after its prop has been removed and a weight equivalent to it has been added to the nose.

Propeller efficiency may also be determined experimentally, but tests made in Boston on indoor propellers show that the efficiencies range from 40% for very poor props to 50% for the best ones tested. Therefore, 50% may be used as the efficiency of a typical indoor propeller without serious error.

An example will demonstrate the use of this formula. Consider an indoor model of the following characteristics:

Weight without rubber.....080 oz.
Weight of rubber (18-inch loop 7/64-inch)070 oz.
Time required to glide model from 6-foot altitude (72-inches)17 seconds
Sinking speed equals 72/17 or 4.23 inches per second.
Endurance = $\frac{30,000 \times .070 \times .50}{(.080 + .070)(4.23)} = 1652$ seconds or 27.6 minutes.

More than 27 minutes! The classroom is in an uproar. Quiet, quiet, everybody! That this is longer than any such model has ever flown is explained by the facts that it is rarely possible under contest conditions to put the maximum number of turns in the rubber, that propeller efficiency is lower at the start of the flight and that the adjustment of a model never remains perfect throughout the flight. The result given by the formula may be regarded therefore as a theoretical maximum which it is possible to reach only if everything is perfect.

However, the class can use the formula to compare various models without taking time off from their studies to travel to the Lakehurst or Akron airdocks to give their planes actual flight tests.

The formula also indicates the *only* means by which endurance may be increased; that is, by increasing the weight of rubber and the propeller efficiency, and by reducing the total weight and the sinking speed.

Class'll be called to order next month for a concluding discussion which will consider best means for increasing indoor endurance.

The Plane On The Cover

(Continued from page 17)

use of extended lead weights. Dual air-speed indicators are carried in each wing tip for more accurate readings.

The fuselage is built up on a framework of welded chrome-molybdenum steel tubing. The forward portion is covered with dural sheet, the top partly with sheet and partly with plywood, and the sides and bottom with fabric. The fuselage cross-section varies progressively rearward from a circular section at the nose to a perfect rectangular section at the rear. From the wing trailing edge to the rudder post the bottom of the fuselage is perfectly flat to aid the belly gunner in the use of his weapon.

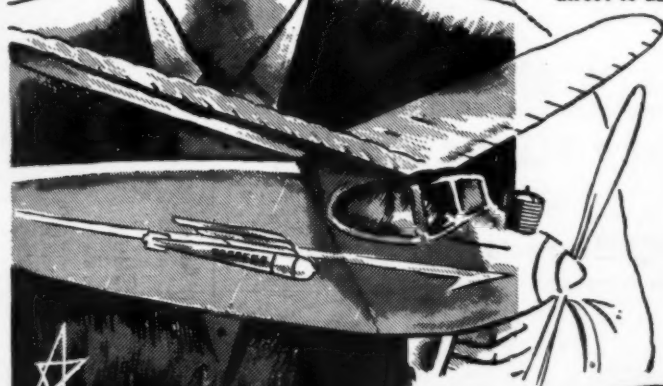
The pilot and radio operator's cabin is situated high atop the fuselage on the turtle-back with sliding hatches within a glass enclosure. The cabin is very narrow and low and excellently streamlined. To the rear, within the continuation of the cabin is the rear gunner located within a glass enclosed compartment with a retracting rear portion which slides down within the fuselage to permit egress for the top machine gun. Within the nose below the center line is a glass enclosure housing the bombardier with provisions for a machine gun being optional. The rear gunner is located beneath the fuse-

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Mighty Midget GASOLINE ENGINES

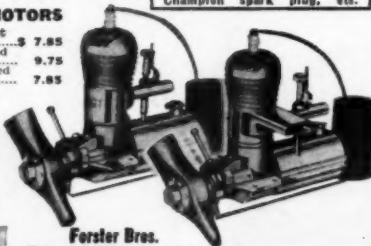
Complete, Ready to Run. Including a Tru-Pitch Prop., oil, instructive manual and double guarantee.

Only **\$9.50** Postpaid

OTHER BUNCH MOTORS

MIGHTY-MIDGET Upright Kit	\$ 7.95
MIGHTY-MIDGET Inverted Assembled	9.75
MIGHTY-MIDGET Inverted Kit	7.95
WIN-AERO Upright Assembled	12.00
WIN-AERO Upright Kit	9.95
WIN-AERO Inverted Assembled	12.50
WIN-AERO Inverted Kit	9.85
MIGHTY MARINE Assembled	12.50
MIGHTY MARINE Kit	10.85

All prices are postpaid



Forster Bros.

Bore 1-1/16", stroke 1 1/4", 1/2 H.P., 2 piston rings, wt. 14 oz.
Model "B", Air cooled, Bronze bearing. **\$17.75**
With Ball Bearing. **\$19.50**
Model C Water Cooled, Bronze Bearing. **\$17.75**
The same with Ball Bearing. **\$19.50**
Prices are postpaid for complete motor including propeller, oil and double guarantee (no prop. with water cooled motors). Flywheels **\$1.95**

New Gasoline M & M Motor

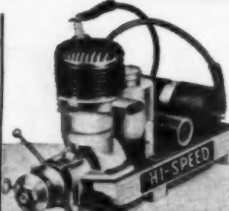
Dis. 292 cu. in., bore 3/32" str. 23/32", wt. bare motor 4 1/2 oz. Trans- parent gas tank, etc. Complete with coil, condenser, prop. oil. Double Guarantee.

Piston Valve **\$16.50**
P.P.



HI-SPEED ENGINE

1/7 H.P.—6,500 R.P.M. Bare Weight 3 1/2 oz. ONLY **\$12.75** Postpaid including propeller

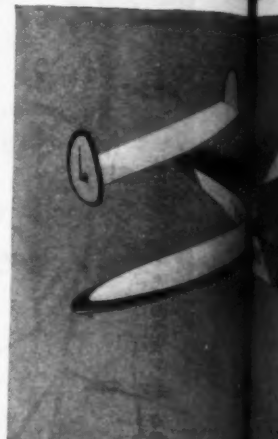


SCIENTIFIC

in every way

IF you take your model planes seriously, you should be completely stocked with all accessories. You get extra sky mileage and described on this page . . . go to your dealer

"Miss World's Fair"



JUST as the World's Fair is the talk of the model world, it is the name, "Miss World's Fair" is as proven by tested performance. A special feature is the fact that are no complicated details and building her. Before you know it she is flying as much as 3 miles . . . will imagine she is piloted by the three-point landing.

In addition every kit contains size plans and detailed drawings. COMPLETE with 15" machine drilled propeller; ball bearing shaft ribs, bulkheads, etc., clearly formed wire parts; streamlined quantities of cement and putty; for windows; approximately 1/2 lb. brown contest rubber; washers, celluloid, etc. Flies 1 mile. Span, 1 3/4". Weight 6 to 8 oz. P.P. or at your dealer



SCIENTIFIC MODEL

218-220 MA-8 Market Street
In England: Model Supply Stores, 17 Brazenose St., Wandsworth
In South Africa: Yardley's, 33, Kerk St., Johannesburg

SCIENTIFIC

name implies

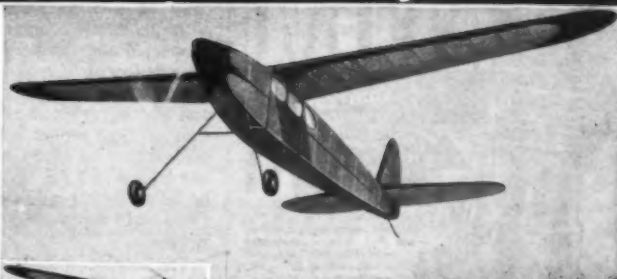
Extra Mileage with these Sky Chasers

Oriole

Flies Up To 3 Miles

Talk about your mileage . . . this "giant" flies 2 to 3 miles. Has the endurance of many much more expensive flyers. Her graceful streamlines make her a beauty to behold. You will gasp when she takes off and with the rapidity with which she climbs at topnotch speed. All details of the Oriole conform with N.A.A. Contest requirements. Of course SCIENTIFIC made and the kit is complete in every detail. Big 50" wing span, length 34".

\$1.00
P.P. or at
Your Dealer



The Jitterbug

A Proven Endurance Model

Rubber powered endurance model. You will admit that 6,000 feet is a lot of distance for a 25" wingspan rubber powered model . . . that is the record of the JITTERBUG's performance. The JITTERBUG has the "swish" that just makes you hold your breath for admiration. Needless to say, she is furnished with complete parts and materials, along with full size simplified plans, which include streamline wheels, ready made propeller, etc. Another breath-taking feature of the Jitterbug is the extreme low price —see it at your dealer today!

50c

Postpaid



GET THE THRILLS OF GAS MODEL FLIGHT

THEY LOOK, FLY AND SOUND LIKE GAS MODELS

The Flea

36" Wingspan

A fitting name because she chases through the air . . . darts in and out everywhere. One experienced model builder testifies that his Flea model flew 10,000 feet. Others report similar flights. Kit furnished complete with M & M Pneumatic Rubber Wheels

\$1.95
P.P. or at
Your Dealer

FLIES 1 MILE



Miss AMERICA

Here's a Gas Type Rubber Powered model plane that fools them all when she is in the air. Any expert will be willing to bet that she is a gas model because that is exactly what she looks and acts like. Has 40" Wingspan. Weight 4 1/2 oz. Length 27 1/2". Rarely flies short of a mile. Looks like a daughter of the original Miss America because she is exactly simulated in all details. Price includes a pair of M & M pneumatic rubber wheels and of course the usual complete SCIENTIFIC parts, accessories, plans, etc.

\$1.95
P.P. or at
Your Dealer



The FIREFLY

Gas Type Rubber Powered Model Airplane

Wingspan 36". Length 28". Weight 4 oz. A builder of the Firefly recently wrote, "How can you give so much for so little?" Open your kit and you will find that SCIENTIFIC has not overlooked a single detail in order to insure highest results. The Firefly is such outstanding value that it really would require a page to include all of its details. See it at your dealer or order direct from us. You will note it has eye value and pocket value. The ratchet motor-hum effect will

give you an extra thrill, not to mention how the M & M pneumatic rubber wheels enhance its efficiency and appearance

\$1.95
P.P. or at
Your Dealer



planes will demand precision made kits with all SCIENTIFIC simplified plans are the reason why your next model is expertly made by craftsmen who build them. . . read over the sensational offers page and . . . order direct from us.

World's Fair" FLIES ONE MILE



SCIENTIFIC enthusiast writes:

How you get out such beautiful and accurate models do, and of course speculate all over to who, what sort of and how. My hat is to World's Fair" in her class. She has just a thing I have ever liked in my own string of

M.D.W., Cape Cod, Mass.

air is the world, is "Miss World's Fair" airplane. It is indeed fitting to give her the Fair" is outstanding in every respect performance, yes, indeed, "tops" in every way. The fact is easy to build because there is and detailed plans enable you to speed up know the ready to wind up the rubber motor onto a professional-like flight oftentimes . . . of your breath because you ted by she she will make a perfect

contains clear, full direct IT IS 100% machine made center wing flat parts, early sheet metal; liberal d parts; celluloid quality nose plug; file. Span. Length P.P. or Dealer.

\$1.50
P.P. or at
Your Dealer



Zephyr Gas Model

Champion of France

This gas model is as big in size as it is in value. Has 6 ft. wing, length 50", weight (less motor) 2 1/2 lbs. Complete kit, has motor and wheels, postpaid

\$4.95

Price including pneumatic rubber wheels. Postpaid \$5.95

AIRPLANE CO.

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No matter what you want
in **GAS MODELS,**
PARTS or SUPPLIES
you can get 'em all from
CLEVELAND

"GAS MODEL SUPPLY CENTER OF THE U. S."



NOTE. Dry kits contain full size drawing, covering tissue, printed wood, strip wood, music wire, celluloid, nose blocks, screws, etc. Wet kits have all chemicals, colored dopes and pneumatic wheels added. Complete kits have everything the "Wet" and "Dry" kits have plus a timer, battery holder, booster plugs, jacks, hook up wire and a propeller to fit your motor. Select the motor you desire and add to the complete kit price and you will have everything you need for your gas model.

GAS MODEL MOTORS AND SUPPLIES

BROWN "D"

\$12.50

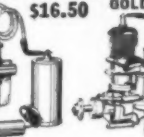
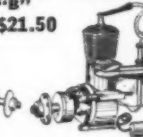
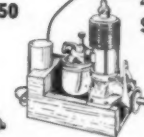
BROWN "B"

\$21.50

OHLSSON "23"

\$16.50

\$18.50 OHLSSON GOLD SEAL



NOTE: Include 15c packing charge on ALL ORDERS UNDER \$5.00 except coils and wheels. Everything in stock for immediate shipment.

COMPLETE GAS MODEL KITS INCLUDING LIQUIDS (Except Power Unit)

6'-4" Howard D.G.A.-8-S	\$12.50
6'-5 1/2" Fairchild	9.95
Ranger "24"	9.95
45" Midget Hawk	3.95
6'-4" Luscombe Phantom	13.95
71 1/2" Chester's (Jeep)	11.95
76" Monocoupe 90-A	12.50
72" Fager Navy Racer	15.95
79 1/2" New Taylor Cub	8.50
6' Silver Flyer	6.50

GAS MOTORS

All motors listed are ready to run, postpaid, and include gas tank, coil and condenser.

Ohlsson "23"	\$16.50
Ohlsson-Gold Seal	18.50
Brown Jr. Model D	12.50
Brown Jr. Model C	17.00
Brown Jr. Model B	21.50
Synco "ACE"	13.75
Synco "ACE" Special	9.95
Synco "BEE"	12.50

Dennymite Special

14.50

Dennymite De Luxe 17.85

QUALITY PROPELLERS—Plain

Wood 9-10-11-12-13-

14 in. Dia., each .50

Laminated Props, 12" 1.25

2 1/2 Volt Air Wheels, 1.50

3 1/2 Volt Air Wheels, 1.75

4 1/2 Volt Air Wheels, 1.75

Varnished Props, 12" 8 or 10" 75¢, 11" 85¢, 12" 90¢, 13" 95¢

Balsa Wood Wheels, .50

bronze bushings, 3/16" dia. x 1-5/16" pr. .05

Wheel Shoe Blocks for 3 1/2" wheels, set. .05

Silk A-grade .50 yd. .80

Silk AA grade .80 yd. .80

Amer. Bamboo Tissue, white & colors, sheet .10

Aluminum Angle 1/2 x 1/2 1/16" .15

1" size .15

Stripping Tape, 10 ft. .15

Brass Collars with set screws—1/4-3/32-3/16" 7/32 holes, pair. .05

Our complete catalog (10c)

lists Wood Strips, Wire, Dopes and thousands of other items for all types of model work.



71" SILVER FLYER \$6.50



71" TAYLOR CUB \$3.50



71" Chester's "JEEP" \$11.95

SPECIAL KITS
for these
& GAS
MODELS
Surrounding
this box
includes
everything
except
motor



72" NAVY RACER \$9.85

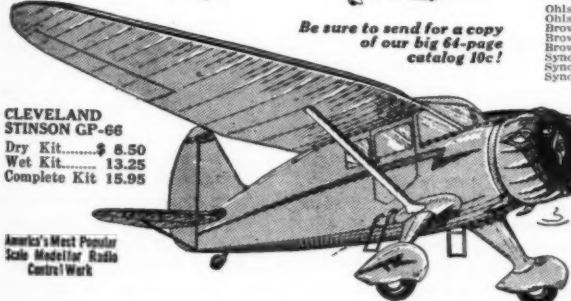


76" SPAN \$13.95



11" FAIRCHILD RANGER \$9.95

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of our big 64-page
catalog 10c!



CLEVELAND STINSON GP-66
Dry Kit.....\$ 6.50
Wet Kit.....13.25
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R15 Fokker D-7	R57 Great Lakes Trainer	R70 William Grumman
R21 Curtiss Hawk	R58 Ryan Sportster	R71 Douglas O-38 OBS.
R23 Mr. Mulligan	R59 Hawker Low Wing	R72 Wedell's W. Wms.
R25 Grumman F2-F1	R60 Stinson Helian	R73 Turner's W. Wms.
R26 Consolidated All	R67 Fairy Battle	R74 Curtiss P11-3
	RX35001 Amphibian	R75 H. H. Comet Racer

EACH 75c

Only 50c apiece

**C-D R.R. KITS
NOW ONLY 10c & 50c
IN No. 8 CATALOG 10c**



ROBERT'S MILLER SPECIAL Kit AU-1
4 1/2"—Red, Nose Black, White Monorails



MAY SNYDER'S SPARKS SPECIAL Kit AU-2
4 1/2"—Dark Blue with White Monorails



SPAW-OFFENHAUSER SPECIAL Kit AU-3
4 1/2"—Green, Red Trim

INDIANAPOLIS RACERS!

While there are many hundreds of internationally known race cars, including 3 Indianapolis winners (No. 1, No. 2, No. 3) which anyone may select to model, we have taken these six as the first of a series we shall produce, but—will others duplicate these very same ones? Just watch for leadership in this field. Kits are absolutely complete except for colors, which means they contain the following: body block, cut to size, authentic scale size (not toy) wheels, axles, printed steering wheels, strips for bulges, exhausts, fenders, etc., and on top of this, all even giv. Order by number and name to avoid confusion. Each only.....10c

OTHER RACE CAR KITS

Austin (European) 4 1/2" Kit AU-4	10c
Alfa-Romeo ("") 5" Kit AU-5	10c
Mercedes ("") 5 1/2" Kit AU-6	10c

Packing and Postage Charge 15c as on all orders under \$5.00

C-D Rubber-Driven Models

KIT DESIGN NUMBER	SCALE	SP 3/4"	DE LUKE KIT	D 1/4" KIT
1 Gr. L. Sp. Trainer	1:50	\$2.60	.50	.50
2 T. A. Myrator	1:50	2.50	.50	.50
3 Boeing F12-E	1:50	2.10	.50	.50
4 Sp. with Racer-3			.40	.40
12 Bishop's Newport			.30	.30
13 Rickenbacker Spad			.30	.30
15 Fokker D-7 Fighter			.40	.40
17 Bayles' Gee-Bee			.30	.30
18 Howard "Pete"			.25	.25
19 Supermarine 56-B	1:75	2.25	.65	.65
21 Hawk P6-E Fighter	2:25	3.00	.85	.85
27 Doolittle's Gee-Bee	1:50	1.95	.50	.50
28 Monocoupe Sport	1:50	1.95	.50	.50
28 Boeing F1B-3 Fight	1:50	1.95	.50	.50
35 Boeing 247 T			1.95	1.95
42 Howard "Big"	98	1.25	.25	.25
43 Douglas O-38 OBS.	2:50	2.90	.80	.80
45 Martin Bomber	1:50	2.00	1.95	1.95
47 Wedell's W. Wms.	1:75	2.30	.50	.50
48 Turner's W. Wms.	1:75	2.50	.50	.50
49 Curtiss P11-3	2:50	2.90	.80	.80
51 D. H. Comet Racer	1:75	2.50	.50	.50
52 "Mr. Mulligan"			.50	.50
55 Douglas Transport	1:75	2.50	2.50	2.50
58 Boeing P26-A	2:25	3.00	.85	.85
61 Seversky Fighter	1:50	2.95	.80	.80
62 Custom Waco C6			.85	.85
63 "Big Caudron Rgt"	1:50	2.00	.50	.50
64 Beechcraft C-17-B			.85	.85
65 Lockheed Electra	1:50	2.00	1.95	1.95
71 "77 Fokker"	1:50	2.00	.50	.50
72 Turner Laird	1:75	2.50	.50	.50

De Luxe sets also available for D-35, D-45, D-65 at \$2.75 each. D-55 at \$3.25.

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Contains 3 great lines of C-D airplanes, also 5c gliders and 10c and 25c airplanes for beginners and larger ready-to-fly models. Also model railroad equipment and toy trains, 25c up in C, D, D, 09, and HO gauge; a wide variety of gas model airplanes and all well-known makes of gas engines; gas and "rubber driven" supplies; also "general" supplies for railroad and innumerable model uses; authentic 10c, race cars, hand tools and power machinery, fine cameras, telescopes, microscopes and a wide variety of ship kits and fittings. Nearly everything a real model builder could wish for within its pages for only one thin dime. **Only 10c** Send for it today!

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See your dealer first—if he can't supply you, send check or M.O. (cash at own risk) with 15c for packing and postage. Under \$5.00 no C.O.D.'s. Outside U. S. add 10% extra.

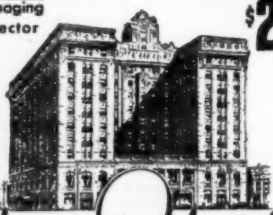
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GUY TOOMBES
Managing
Director

ROOMS FROM

\$2⁵⁰



Hotel Utah

SALT LAKE CITY

THE NEW MERCURY

GAS MODEL BY SCIENTIFIC

See Page 37

FREE

with all orders over \$1.00
choice of (1) Model Knife
(2) 2oz. cement or dope
(3) 6 1/4x2 balsa sheets

5 Foot Balsa		18" Balsa Planks		18" Balsa	
1/4x1/4	10 for 10c	1/4x1/4	3 for 5c	1/16x1/16	60 5c
1/4x2/16	6 for 10c	1/4x1/2	1 for 5c	1/16x3/16	35 5c
1/4x3/4	5 for 10c	1x2	1 for 9c	1/16x3/16	18 5c
3/16x3/16		2x2	1 for 16c	1/16x3/4	15 5c
		2x3	1 for 22c	3/32x3/32	30 5c
		2x6	1 for 38c	1/4x1/4	30 5c
		3x6	1 for 72c	1/4x3/16	12 5c
1/4x1/4	3 for 10c	Nose Blocks			
1/4x1/4	1 for 67c	1x2x1	1c	3/16x3/16	8 5c
1/4x1/4	1 for 10c	2x2x1	3c	1/4x1/2	5 5c
1/4x1/4	1 for 10c	2x2x1	4c	18" Balsa Sheets	
In 5 ft. balsa		3x3x2	7c	1/64x2	6 10c
sheets cost 4 times		3x3x3	9c	1/32x2	9 10c
18" prices. Add		5x3x2	23c	3/32x2	7 10c
28c pack. charges				1/2x2	6 10c
Propellers		Prop Blocks		1/2x2	3 8c
Machine	Paul	1/4x1/4x5	7 5c	1/2x2	3 8c
cut	o wina	1/4x1/4x6	6 5c	1/2x2	3 8c
5" 4c	7c	1/4x1/4x8	3 5c	1/2x2	3 8c
6" 5c	11c	1/4x1/4x10	2 5c	1/2x2	3 8c
7" 6c	16c	1/4x1/4x12	3c ea.	1/2x2	3 8c
8" 7c	20c	1x1 1/2x12	5c ea.	1/2x2	3 8c
9" 8c	24c	1x1 1/2x15	6c ea.	1/2x2	3 8c
10" 9c	27c	Microfilm rubber			
12" 10c	35c	lube, wood filler			
14" 12c	X	1 ea. 10c 2 oz. 15c			
15" X	48c				
16" 15c	72c				
Wheels per pr.		SHEET CELLULOID			
1/4" balsa coil		2x6 3c	5x7 4c	1x17 15c	
1/4" 1c	3c	COLORED DOPE			
1/4" 2c	4c	1 oz. 6c 2 oz. 11c			
1/4" 3c	5c	1/2 Pt. 35c			
1/4" 4c	6c	Brown Rubber			
1/4" 5c	7c	1/16 sz. 15 ft. 5c			
1/4" 6c	8c	1/16 sz. 15 ft. 5c			
1/4" 7c	9c	1/16 sz. 15 ft. 5c			
1/4" 8c	10c	1/16 sz. 15 ft. 5c			
1/4" 9c	11c	1/16 sz. 15 ft. 5c			
1/4" 10c	12c	1/16 sz. 15 ft. 5c			
1/4" 11c	13c	1/16 sz. 15 ft. 5c			
1/4" 12c	14c	1/16 sz. 15 ft. 5c			
1/4" 13c	15c	1/16 sz. 15 ft. 5c			
1/4" 14c	16c	1/16 sz. 15 ft. 5c			
1/4" 15c	17c	1/16 sz. 15 ft. 5c			
1/4" 16c	18c	1/16 sz. 15 ft. 5c			
1/4" 17c	19c	1/16 sz. 15 ft. 5c			
1/4" 18c	20c	1/16 sz. 15 ft. 5c			
1/4" 19c	21c	1/16 sz. 15 ft. 5c			
1/4" 20c	22c	1/16 sz. 15 ft. 5c			
1/4" 21c	23c	1/16 sz. 15 ft. 5c			
1/4" 22c	24c	1/16 sz. 15 ft. 5c			
1/4" 23c	25c	1/16 sz. 15 ft. 5c			
1/4" 24c	26c	1/16 sz. 15 ft. 5c			
1/4" 25c	27c	1/16 sz. 15 ft. 5c			
1/4" 26c	28c	1/16 sz. 15 ft. 5c			
1/4" 27c	29c	1/16 sz. 15 ft. 5c			
1/4" 28c	30c	1/16 sz. 15 ft. 5c			
1/4" 29c	31c	1/16 sz. 15 ft. 5c			
1/4" 30c	32c	1/16 sz. 15 ft. 5c			
1/4" 31c	33c	1/16 sz. 15 ft. 5c			
1/4" 32c	34c	1/16 sz. 15 ft. 5c			
1/4" 33c	35c	1/16 sz. 15 ft. 5c			
1/4" 34c	36c	1/16 sz. 15 ft. 5c			
1/4" 35c	37c	1/16 sz. 15 ft. 5c			
1/4" 36c	38c	1/16 sz. 15 ft. 5c			
1/4" 37c	39c	1/16 sz. 15 ft. 5c			
1/4" 38c	40c	1/16 sz. 15 ft. 5c			
1/4" 39c	41c	1/16 sz. 15 ft. 5c			
1/4" 40c	42c	1/16 sz. 15 ft. 5c			
1/4" 41c	43c	1/16 sz. 15 ft. 5c			
1/4" 42c	44c	1/16 sz. 15 ft. 5c			
1/4" 43c	45c	1/16 sz. 15 ft. 5c			
1/4" 44c	46c	1/16 sz. 15 ft. 5c			
1/4" 45c	47c	1/16 sz. 15 ft. 5c			
1/4" 46c	48c	1/16 sz. 15 ft. 5c			
1/4" 47c	49c	1/16 sz. 15 ft. 5c			
1/4" 48c	50c	1/16 sz. 15 ft. 5c			
1/4" 49c	51c	1/16 sz. 15 ft. 5c			
1/4" 50c	52c	1/16 sz. 15 ft. 5c			
1/4" 51c	53c	1/16 sz. 15 ft. 5c			
1/4" 52c	54c	1/16 sz. 15 ft. 5c			
1/4" 53c	55c	1/16 sz. 15 ft. 5c			
1/4" 54c	56c	1/16 sz. 15 ft. 5c			
1/4" 55c	57c	1/16 sz. 15 ft. 5c			
1/4" 56c	58c	1/16 sz. 15 ft. 5c			
1/4" 57c	59c	1/16 sz. 15 ft. 5c			
1/4" 58c	60c	1/16 sz. 15 ft. 5c			
1/4" 59c	61c	1/16 sz. 15 ft. 5c			
1/4" 60c	62c	1/16 sz. 15 ft. 5c			
1/4" 61c	63c	1/16 sz. 15 ft. 5c			
1/4" 62c	64c	1/16 sz. 15 ft. 5c			
1/4" 63c	65c	1/16 sz. 15 ft. 5c			
1/4" 64c	66c	1/16 sz. 15 ft. 5c			
1/4" 65c	67c	1/16 sz. 15 ft. 5c			
1/4" 66c	68c	1/16 sz. 15 ft. 5c			
1/4" 67c	69c	1/16 sz. 15 ft. 5c			
1/4" 68c	70c	1/16 sz. 15 ft. 5c			
1/4" 69c	71c	1/16 sz. 15 ft. 5c			
1/4" 70c	72c	1/16 sz. 15 ft. 5c			
1/4" 71c	73c	1/16 sz. 15 ft. 5c			
1/4" 72c	74c	1/16 sz. 15 ft. 5c			
1/4" 73c	75c	1/16 sz. 15 ft. 5c			
1/4" 74c	76c	1/16 sz. 15 ft. 5c			
1/4" 75c	77c	1/16 sz. 15 ft. 5c			
1/4" 76c	78c	1/16 sz. 15 ft. 5c			
1/4" 77c	79c	1/16 sz. 15 ft. 5c			
1/4" 78c	80c	1/16 sz. 15 ft. 5c			
1/4" 79c	81c	1/16 sz. 15 ft. 5c			
1/4" 80c	82c	1/16 sz. 15 ft. 5c			
1/4" 81c	83c	1/16 sz. 15 ft. 5c			
1/4" 82c	84c	1/16 sz. 15 ft. 5c			
1/4" 83c	85c	1/16 sz. 15 ft. 5c			
1/4" 84c	86c	1/16 sz. 15 ft. 5c			
1/4" 85c	87c	1/16 sz. 15 ft. 5c			
1/4" 86c	88c	1/16 sz. 15 ft. 5c			
1/4" 87c	89c	1/16 sz. 15 ft. 5c			
1/4" 88c	90c	1/16 sz. 15 ft. 5c			
1/4" 89c	91c	1/16 sz. 15 ft. 5c			
1/4" 90c	92c	1/16 sz. 15 ft. 5c			
1/4" 91c	93c	1/16 sz. 15 ft. 5c			
1/4" 92c	94c	1/16 sz. 15 ft. 5c			
1/4" 93c	95c	1/16 sz. 15 ft. 5c			
1/4" 94c	96c	1/16 sz. 15 ft. 5c			
1/4" 95c	97c	1/16 sz. 15 ft. 5c			
1/4" 96c	98c	1/16 sz. 15 ft. 5c			
1/4" 97c	99c	1/16 sz. 15 ft. 5c			
1/4" 98c	100c	1/16 sz. 15 ft. 5c			
1/4" 99c	101c	1/16 sz. 15 ft. 5c			
1/4" 100c	102c	1/16 sz. 15 ft. 5c			
1/4" 101c	103c	1/16 sz. 15 ft. 5c			
1/4" 102c	104c	1/16 sz. 15 ft. 5c			
1/4" 103c	105c	1/16 sz. 15 ft. 5c			
1/4" 104c	106c	1/16 sz. 15 ft. 5c			
1/4" 105c	107c	1/16 sz. 15 ft. 5c			
1/4" 106c	108c	1/16 sz. 15 ft. 5c			
1/4" 107c	109c	1/16 sz. 15 ft. 5c			
1/4" 108c	110c	1/16 sz. 15 ft. 5c			
1/4" 109c	111c	1/16 sz. 15 ft. 5c			
1/4" 110c	112c	1/16 sz. 15 ft. 5c			
1/4" 111c	113c	1/16 sz. 15 ft. 5c			
1/4" 112c	114c	1/16 sz. 15 ft. 5c			
1/4" 113c	115c	1/16 sz. 15 ft. 5c			
1/4" 114c	116c	1/16 sz. 15 ft. 5c			
1/4" 115c	117c	1/16 sz. 15 ft. 5c			
1/4" 116c	118c	1/16 sz. 15 ft. 5c			
1/4" 117c	119c	1/16 sz. 15 ft. 5c			
1/4" 118c	120c	1/16 sz. 15 ft. 5c			
1/4" 119c	121c	1/16 sz. 15 ft. 5c			
1/4" 120c	122c	1/16 sz. 15 ft. 5c			
1/4" 121c	123c	1/16 sz. 15 ft. 5c			
1/4" 122c	124c	1/16 sz. 15 ft. 5c			
1/4" 123c	125c	1/16 sz. 15 ft. 5c			
1/4" 124c	126c	1/16 sz. 15 ft. 5c			
1/4" 125c	127c	1/16 sz. 15 ft. 5c			
1/4" 126c	128c	1/16 sz. 15 ft. 5c			
1/4" 127c	129c	1/16 sz. 15 ft. 5c			
1/4" 128c	130c	1/16 sz. 15 ft. 5c			
1/4" 129c	131c	1/16 sz. 15 ft. 5c			
1/4" 130c	132c	1/16 sz. 15 ft. 5c			
1/4" 131c	133c	1/16 sz. 15 ft. 5c			
1/4" 132c	134c	1/16 sz. 15 ft. 5c			
1/4" 133c	135c	1/16 sz. 15 ft. 5c			
1/4" 134c	136c	1/16 sz. 15 ft. 5c			
1/4" 135c	137c	1/16 sz. 15 ft. 5c			
1/4" 136c	138c	1/16 sz. 15 ft. 5c			
1/4" 137c	139c	1/16 sz. 15 ft. 5c			
1/4" 138c	140c	1/16 sz. 15 ft. 5c			
1/4" 139c	141c	1/16 sz. 15 ft. 5c			
1/4" 140c	142c	1/16 sz. 15 ft. 5c			
1/4" 141c	143c	1/16 sz. 15 ft. 5c			
1/4" 142c	144c	1/16 sz. 15 ft. 5c			
1/4" 143c	145c	1/16 sz. 15 ft. 5c			
1/4" 144c	146c	1/16 sz. 15 ft. 5c			
1/4" 145c	147c	1/16 sz. 15 ft. 5c			
1/4" 146c	148c	1/16 sz. 15 ft. 5c			
1/4" 147c	149c	1/16 sz. 15 ft. 5c			
1/4" 148c	150c	1/16 sz. 15 ft. 5c			
1/4" 149c	151c	1/16 sz. 15 ft. 5c			
1/4" 150c	152c	1/16 sz. 15 ft. 5c			
1/4" 151c	153c	1/16 sz. 15 ft. 5c			
1/4" 152c	154c	1/16 sz. 15 ft. 5c			
1/4" 153c	155c	1/16 sz. 15 ft. 5c			
1/4" 154c	156c	1/16 sz. 15 ft. 5c			
1/4" 155c	157c	1/16 sz. 15 ft. 5c			
1/4" 156c	158c	1/16 sz. 15 ft. 5c			
1/4" 157c	159c	1/16 sz. 15 ft. 5c			
1/4" 158c	160c	1/16 sz. 15 ft. 5c			
1/4" 159c	161c	1/16 sz. 15 ft. 5c			
1/4" 160c	162c	1/16 sz. 15 ft. 5c			
1/4" 161c	163c	1/16 sz. 15 ft. 5c			
1/4" 162c	164c	1/16 sz. 15 ft. 5c			
1/4" 163c	165c	1/16 sz. 15 ft. 5c			
1/4" 164c	166c	1/16 sz. 15 ft. 5c			
1/4" 165c	167c	1/16 sz. 15 ft. 5c			
1/4" 166c	168c	1/16 sz. 15 ft. 5c			
1/4" 167c	169c	1/16 sz. 15 ft. 5c			
1/4" 168c	170c	1/16 sz. 15 ft. 5c			
1/4" 169c	171c	1/16 sz. 15 ft. 5c			
1/4" 170c	172c	1/16 sz. 15 ft. 5c			
1/4" 171c	173c	1/16 sz. 15 ft. 5c			
1/4" 172c	174c	1/16 sz. 15 ft. 5c			
1/4" 173c	175c	1/16 sz. 15 ft. 5c			
1/4" 174c	176c	1/16 sz. 15 ft. 5c			
1/4" 175c	177c	1/16 sz. 15 ft. 5c			
1/4" 176c	178c	1/16 sz. 15 ft. 5c			
1/4" 177c	179c	1/16 sz. 15 ft. 5c			
1/4" 178c	180c	1/16 sz. 15 ft. 5c			
1/4" 179c	181c	1/16 sz. 15 ft. 5c			
1/4" 180c	182c	1/16 sz. 15 ft. 5c			
1/4" 181c	183c	1/16 sz. 15 ft. 5c			
1/4" 182c	184c	1/16 sz. 15 ft. 5c			
1/4" 183c	185c	1/16 sz. 15 ft. 5c			
1/4" 184c	186c	1/16 sz. 15 ft. 5c			
1/4" 185c	187c	1/16 sz. 15 ft. 5c			
1/4" 186c	188c	1/16 sz. 15 ft. 5c			
1/4" 187c	189c	1/16 sz. 15 ft. 5c			
1/4" 188c	190c	1/16 sz. 15 ft. 5c			
1/4" 189c	191c	1/16 sz. 15 ft. 5c			
1/4" 190c	192c	1/16 sz. 15 ft. 5c			
1/4" 191c	193c	1/16 sz. 15 ft. 5c			
1/4" 192c	194c	1/16 sz. 15 ft. 5c			
1/4" 193c	195c	1/16 sz. 15 ft. 5c			
1/4" 194c	196c	1/16 sz. 15 ft. 5c			
1/4" 195c	197c	1/16 sz. 15 ft. 5c			
1/4" 196c	198c	1/16 sz. 15 ft. 5c			
1/4" 197c	199c	1/16 sz. 15 ft. 5c			
1/4" 198c	200c	1/16 sz. 15 ft. 5c			

been guilty of careless construction and it's time to stop hoarding cement. Second, the wing and tail must be lined up and not twisted like the ears of the neighbor's hound. And third your prop must be thin, smooth and balanced. These are the primary requisites for a fine model. If your ship is sturdy, well lined-up and efficiently transforms the energy of the rubber into thrust, it is only a question of a few minor adjustments before you are obtaining good flights. Conversely poor workmanship causes poor flights.

Well, after that sermon on what every good model builder should know, we'll point out that the minor adjustments which were necessary on our test model consisted in warping the left trailing edge down to cure a tendency to spiral to the left under power, and warping the elevators up to compensate for the slight weight of that nose wheel.

As for ruggedness and flight ability: the wife of our local club president picked the ship up, put a few turns in and hurled it at us bodily. The model nonchalantly pulled up over our head, smacked into the light fixture, spun down to the living room table, and then scudded around unscathed like a hungry cockroach. Yep, she's a good ship.

Good luck with your Seversky Executive.

Flash-News

(Continued from page 26)

is the plan of Admiral William D. Leahy, soon to become its governor. Tunnel airports, fast fighting planes will be included, he states.

Record: Rene leFevre in a Lockheed 14 from Paris to Brazzaville, Equatorial Africa. Course of 4,781 miles covered in 26 hours, 50 minutes flying time. Two more Model 14's on order for the French Air Ministry. Also Marshall Headle, Lockheed test pilot, from Paris to Algiers in 3 hours, 55 minutes in a 14.

England training her fuzzy-cheeked pilots in a great and foolish hurry is report. Result: Five killed in the mid-air collision of a bomber and a fighter, two killed in the crash of a Fairey "Battle," one crashed and pinned in wreckage for 24 hours before wayfarer rescued him.

Irish Sea Airways, Dublin to London Airway, will use Lockheed 14's.

Captain Polina Ossipenko, famed Russian woman flier, and companion killed in crash. She handled the record-breaking far-East flight of 3,717 miles last winter.

Mme. Olga Girod, French champion woman glider pilot killed in glider crash.

New "Duplex-Cyclone" installed on startling Consolidated Flying Boat, the largest and most powerful air-cooled aircraft engine in the world, develops two thousand horsepower from its 18 cylinders.

President Roosevelt shelved the navy's plans for a three million dollar dirigible, bids on which were recently rejected. Struggle continues, with fate against lighter than air. K-2, navy's largest nonrigid blimp crashed into tree and collapsed at Lakehurst during a training flight.

Jonathan Browning, one of armaments three famous brothers, died in a conference

Meet the New Champion



SCIENTIFIC.... Announces the new "MERCURY"

HIGH CLIMB GAS MODEL

SPECIFICATIONS: Wingspan 6 feet, overall length 52", total weight, with motor and ignition units: 2 3/4 lbs.

CLIMBS AT RATE OF 1,000 FEET PER MINUTE

THIS new Scientific Gas Model has many distinctive features that you would only expect to find in kits selling at much higher prices. The complete model is light, weighing only 2 3/4 pounds ready to fly, yet by applying regular aircraft construction it is as strong as ships weighing 4 to 5 pounds.

The flying qualities of this model are far in excess of anything you might expect. Its light weight puts it in the air with a very short run, even with the motor running at half speed. Its stability is amazing, recovering rapidly from any position in which a steep climb or gust of wind may put it. It glides in long and flat, hovering about six inches off the ground for 20 feet or more, then gradually settling to the ground in an easy, smooth, three point landing.

The "MERCURY" offers you the "tops" in gas models at a very low price.

KIT IS COMPLETE with all necessary materials including a pair of 3 1/2" streamline balsa wheels; shaped prop. blank; all hardware parts; ignition wire; cement; bamboo paper; giant full size plan with instructions, etc., etc.

\$4.95
less motor
POSTPAID, OR
AT YOUR DEALER

DE LUXE KIT: Complete as above, plus the addition of yellow, blue, and gold Scientific Dope, and a pair of 3 1/2" Pneumatic Rubber Wheels (in place of balsa wheels). A \$10.00 value for only **\$6.95** (less motor)

POSTPAID OR AT YOUR DEALER

SCIENTIFIC MODEL AIRPLANE CO.
218-220 MARKET ST., DEPT. MA-8 NEWARK, N. J.

MERCURY



Here's an actual picture story of the "Mercury's" test flight at Paterson, N. J., on March 5.



And the "Mercury" off like a flash, after a short run, climbing at the amazing rate of over 1,000 feet a minute.



After 15 seconds, the motor shuts off, the model rapidly recovers from its steep climb, going into a beautiful long flat glide.



Now the "Mercury" coming in perfectly poised for a 3 point landing. A perfect flight!

over a new gun. His brother John invented them, he built and improved them and Mathew organized the company that marketed the guns.

Former Chief of Los Angeles Police James E. Davis now in charge of spy-catching at the huge Douglas plant where three secret projects are now under way. A full-time job with 6,225 pairs of eyes searching the canvassed-off experimental section.

For Research: A British Monospar T-45 monoplane has been fitted with a pressurized cabin for sub-stratosphere work. Pressure is maintained by the use of a small 27 horsepower aviation engine. The ships engines are only 90 horsepower Pobjoy's (two)!

Earl Ortman, famed racing pilot, now flying shuttle for Canadian-Colonial Airways in big Douglas DC-3 Airliner (New York-Montreal). Will participate in the Races this fall.

Northern Canada is now thick with hardy ski-equipped cargo planes. Eskimos are more familiar with airplanes than street-cars, the telephone or radio. Once the mecca of adventurous pilots with wornout cabin planes with ripped-up seats, the north woods is now teeming with them.

Our Newstory of the Month: Kill Devil Hill, Manteo, North Carolina, is a perpetuated hallowed spot for here, Dec. 17, 1903, man first flew a motor driven airplane. Still a mecca for sightseers, A. W. Drinkwater, the aging telegraph opera-

FREE CREDIT CHECK—See Below!

G-9 Compare It For Price & Performance—it's UNBEATABLE!

Delivers UP To **10,000 R.P.M.** in any position
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Inverted
Horizontal

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BLOOMINGDALE'S R. H. MACY & CO.
PATTERSON BROTHERS
and our own showrooms

In this IMP 'G-9' you own the perfected airplane power plant of tomorrow! It's got everything! Lift, thrust, drive, power to spare! Throttle it down for use on 40' models or, with slight adjustment, it lifts and flies a 12 pound, miniature sky-racer—up to 15 ft. (180 inch!) wingspan with standard wing loading. Radically improved port system plus finger-tip carburetion are exclusive features of 'G-9.' Uninstalling, unfeeling performance regardless of mount. Complete with Coil, condenser and Champion Spark Plug. On Test Block.

\$10.00

SPECIFICATIONS: Wt. bare 9 oz. Bore $\frac{3}{16}$ " Stroke 15/16" R.P. 15,000 plus R.P.M. 300 to 7000 with 12" prop, up to 10,000 with 8" wheel. G-9 will outperform engines selling up to \$20 ON A MONEY-BACK BASIS! There is none finer made at any price—it's magnificent value!

**REARWIN SPEEDSTER**

COMPLETE GAS KIT **\$4.50**
To Make this 64" Model
Nothing Else to Buy! Packing & Postage 30c

Only Model Including Fully Finished Notched and Webbed Paulownia Wing Ribs—for maximum lift; 5-24"x36" Sheets of Famous PERVEL; Movable and Controllable Ailerons, Elevators and Rudder. 3" Puncture Proof Cork-tired Aluminum Balloon Wheels, 1 1/2" Cork-tired Aluminum Tail Wheel & 2 cc. Can Impure Cement, 4-oz. Can Clear Bore Two gas props, one for flight, one for bench testing of motor.

Finest Quality Hard, Medium and Soft Balsa. Brass and Copper Hardware, Aluminum Tubing, Round Bamboo, Cement and Stripping Brushes, Paints, Cores and Sides fully cut. Hard Balsa Wood for special parts, with two sheets of full-size plans (22" x 50" and 16" x 50" size) printed in eye-reading green ink on heavy paper with separate instruction sheets all drawn and redesigned by an aeronautical expert and war-time flyer.

SPECIAL For G-9
PROP
PLAIN . . . 35c
LACQUERED . 50c
IMP Props are triple tested for balance and performance! Be safe with IMP.

Scientifically Balanced
FLYWHEEL
WITH SPINNER
For use with 'G-9' or any motor for boat or auto. **\$1.25** Post Paid

PERVEL
NEW WONDER PLANE COVER
Silk-like in appearance and action. Resistant. Long life! Sew it! Cement it! Dope it! GRAINLESS! No special or tricky ingredients needed! It's a sensation! Three 24"x36" sheets (at dealer's or direct).

ALL BERKELEY Gas Model Kits (up to 5 ft. Wingspan) now feature PERVEL! Selected after exhaustive tests!

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Send 10c (coin or stamps) for illustrated catalog of planes, trains, boats, autos. You will receive a CREDIT COUPON good for 10c cash with any purchase of IMP Products at dealer or direct!

GOOD EVERYWHERE

tor who first flashed to the world the news of the Wright Brothers triumph, now conducts daily tours to the spot with an accompanying lecture. A few weeks ago the small group stood on the windswept dune and listened to the bearded old-timer as he told of that day, 35 years ago, when history was made. Eight young tourists, effervescent with joy, shouted, pointed and laughed aloud. One of their number said: "Gee, I bet if the Wrights were here they could sure tell us all about it!" Some of the group moved away, others followed. Drinkwater called to the boys and they returned to the bus station to return to town. Just as the last of them climbed aboard Drinkwater winked knowingly at a small, white-haired, mustached gentleman and helped him mount the steps. The small man smiled and the bus churned into gear and rumbled away in a cloud of dust. "Yes," Drinkwater mused half-aloud. "He could have told them a lot!" For that man was Orville Wright on one of his more and more infrequent and unnoticed pilgrimages to the spot where our modern world's most ghastly instrument of destruction and most rapid and safest mode of transportation, the airplane, was born.

What To Build For The Wakefield

(Continued from page 23)

lage is finished as a unit; that is, paper covered and doped with banana oil before the covers are cut out, be sure to have some sort of marks to indicate the cover section for cutting. Note that there is a duplication of bulkheads where the covers occur to provide snug fitting. These may be made afterwards.

Planking is surprisingly easy and fast. There is no need of worrying about curved tapers as the soft balsa fits very easily with straight tapers. If the planks do not lay evenly the "slip-ups" are easily corrected with sand paper. In sanding be careful to avoid "windows" of thinned walls; always check after few strokes and use fairly fine paper towards the end. The drawings cover most of the questions which may arise. The fuselage unit itself is comparatively light on the final weight and it is recommended for any sort of design using the basic principle of this style planking.

Wing

The wing might be rather stubby to some but there are good reasons for it. It is a known fact that large chord has better airfoil characteristics than a small chord, and as such it reacts much more effectively. The smaller chords of three inches or less have a tendency to stall very easily and at the same time they approach almost flat-plate characteristics since their minuteness does not allow substantial cambering. The lift of a wing depends on how strong is its reaction on the air molecule. Since airfoils stall sooner at low speed we must provide means of reacting on air at comparatively low incidences or angle of attacks hence the deeply undercambered design.

With such a large chord and limited wing area the ellipse was a "natural."

To meet this specification the construction had to be changed from orthodox, and in conjunction with it the airfoil was also changed so that it is almost flat at the tips. One reason for such airfoil at the tip is to lessen the tip drag as well as decrease the stalling point. However, the stalling portion can almost be forgotten since our large stabilizers never allow the wing to approach near a stall unless the balance or settings are wrong. But the drag part is important especially since the side flow reacts differently on the two tips, and we must not forget the long moment arm of the tips.

The construction itself requires exact precutting of the edges. The trailing edge is cut to shape while the leading edges is tapered in a sort of an elliptical curve and it is bent to shape while the wing is fixed to the board. The exact sizes will have to be determined from the half-size scale drawings. The first step is to draw a full size outline. Make the edges and ribs. Now superimpose the edges over the drawing and hold them in place with pins. Note that the T.E. must be angled near the center and the L.E. twisted to present perpendicular face.

Now it is just a matter of cutting the ribs to sizes measured from the space between the edges. The section will accommodate itself very readily almost up to the tips, and then it is more or less shaped by the eye. Every once in a while sight along the top to be certain of unbroken taper. While the wing halves are still on the board, cement the balsa tips, 1/64" sheet and 1/64" caps. The trailing edges of the sheet can be sanded between the ribs to weakened hollows so that the paper will have no angled breaks. Do likewise with the caps.

After both halves are completely smoothed and sanded, the center section is made up as shown. Pins help in holding the assembly to correct alignment as well as increase the strength. A final touch of extra cement on rib joints completes the wing.

Rudders And Stabilizer

The twin rudders are used to give the stabilizer a higher aspect ratio effect and also to determine how strong the stabilizer must be to support the tail portion on its tips. We had a fond hope of having a single wheel retractable landing gear with twin rudders to provide the needed three points for ground stability. The rudders proved to be too large but the increase of dihedral provided the corrective. This should be kept in mind if lower power is used or if spiral troubles develop in a gas conversion. Outside of the aluminum strip to keep adjustments without cracking the sheet, the drawings cover the constructional details.

The changes indicated on the drawings as modifications for the new rules, and for better stability, have already been made on the model. No difference was found in longitudinal stability with the 33% stabilizer area. The greatest difference was shown by using smaller rudders, as shown in dotted outline. The model now maintains an even keel with no signs of spiral instability. The large six inches dihedral can be cut down to five inches

The Latest-Advanced Design— BERKELEY GAS MODELS

AS usual—Berkeley sets the pace with new designs that are stronger, lighter and better flyers than were ever expected by model builders. Watch these new ships parade across the sky during the coming contests!

"Musketeer-42"

Complete Kit, less wheels and power plant

\$1.95

P.P. in U.S.A.

"MUSKETEER-STANDARD"

For 1/5 and 1/4 H. P. Motors

New "Featherweight" Construction

The "Musketeer" is the latest series of Berkeley Gas Models. Primarily designed for simplicity and high performance. The ship weighs only 2 lbs. 4 oz. ready-to-fly, weight having been reduced to a minimum by eliminating fillets and extra gadgets. The aerodynamic arrangement is entirely new. The wing and stabilizer are set at extremely high angles, giving "Elevator" climb and eliminating the customary dip after the engine cuts. Everything to build the model as pictured (Except wheels and power plant) are included in the kit. Wooden Parts printed out, semi-finished nose block, ignition equipment, metal fittings, "Perrel" Covering. Cement and colored dopes.

Six-Foot Wingspan
Complete kit, less wheels and power plant

\$3.95
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Five-Foot Wingspan
For 1/7 and 1/8 H.P. Motors. Monocoque Construction

Complete Kit
Less Power Plant

\$4.95
P.P.

Class "B" "Cavalier-Sixty"

The "Cavalier-Sixty" is without exaggeration the most stable and most highly developed model in the air today. Its perfect flyability amazed all the experts. While the ship does not climb as fast as smaller class "B" models, its superior glide more than makes up the difference. For soarability in class "B", build a "Cavalier-Sixty." Kit includes everything to build the model as pictured. (Except wheels and power plant.) All blocks semi-finished. Special selected wood for planking. "Perrel" Covering. Transfer insignia. Liberal supply of cement and colored dope.

"Buccaneer-Standard"

51 1/2 ft. Wingspan—For 1/5 and 1/4 H. P. Motors

See!
Berkeley's

Two Displays at the
N. Y. World's Fair

Berkeley Gas models are on exhibit at the entrance to the U. S. Aviation Building and also in the Ecuador Building's halsa products display. Don't fail to see them when you visit the fair.



One Hour- 50 min. on a 201/2 sec. engine run

The above photo shows Bill Huber of the Syracuse Model Airplane Club holding his "Buccaneer-Standard" after its sensational flight officially timed for one hour 50 minutes. Yes sir! Model builders are still having a hard time finding a better contest model than the "Buccaneer-Standard." She won first and second in recent Paterson Meet, first in the North Carolina Tri-State Meet and first two months in a row at Long Beach, Calif. More beginners build the "Buccaneer-Standard" than any other model and still she wins contests!

Complete Kit (Less Wheels and Power Plant)..... **\$5.00 P.P.**

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to show you a Berkeley Kit. All large reputable dealers stock our entire line. We want you to buy from him if it is convenient for you. We want you to see, before you buy, if possible. However, do not accept a "Just as Good" substitute, if your dealer cannot supply you, order direct and get immediate delivery.

Other Berkeley Gas Models:

The "Buccaneer-48", 48" Wingspan, Class "B" Champion \$2.95 P.P.

The "Cavalier-Standard", Six-Foot Wingspan. \$5.95 P.P.

The "Courier-Sportster", Six-Foot Wingspan. N. Y. State Champion \$5.95 P.P.

The "Super-Buccaneer", 7 1/2 Foot Wingspan. Most Famous Gas model. \$8.50 P.P.

The "Custom-Cavalier", Nine-Foot Wingspan. Ideal for Radio Control. \$15.00 P.P.

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We can supply you at regular factory prices with all products of: Junior Motors Corporation (Brown Motors); Ohlsson Miniatures (Ohlsson Motors and Wheels); Miniature Motors Corp. (Bantam Engines); Merikmer Tool and Model Works (O.K. Engines); Syncro Devices (Syncro Engines and Race Cars); Hi-Speed Motors (Hi-Speed and Torpedo Engines); Reginald Denny Industries (Dennymite Motors); M. & W. Model Wheel Co. (M. & W. Valve-in-head Motor & Wheels); Husky Miniature Motors (Husky Engines).

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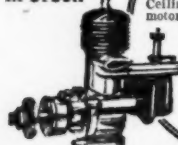
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This rubber holds every world's record. Makes every model a potential winner!

Size	Sc	225'	30c
1/32-28"	Sc	225'	30c
3/64-18"	Sc	225'	40c
1/16-14"	Sc	225'	40c
3/64-12"	Sc	225'	50c
3/32-10"	Sc	225'	50c
7/64-8 1/2"	Sc	225'	70c
6/64-7 1/2"	Sc	225'	70c
9/64-6 1/2"	Sc	225'	80c
3/32-12"	Sc	225'	90c
11/64-10"	Sc	225'	\$1.00
3/16-10"	Sc	225'	\$1.10
1/4-7"	Sc	225'	\$1.25

All 1/30" Thick
Minimum Order 50c

ALUMINUM MOTOR MOUNT 35c PAIR

For all Midget Engines under 1/2 H.P. Weighs 1/2 oz. Only

TAIL
WHEEL
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Aluminum, sponge-rubber wheel, steel. Wt. .50c. All gas models. 50c



Brand new exclusive method makes it possible for even a beginner to build the super streamlined monocoque elliptical all balsa fuselage. Balsa stressed wing. Simple as A, B, C. Every advanced feature incorporated in the kit. Wingspan 30", length 30", Meets N.A.A. rules.

DeLuxe Midget Gas Model Kit for small bore engines THE HUMMING BIRD

Designed to fly as MONOPLANE or BIPLANE. Span 40"—Wt. 18 oz. **YOU CAN CONVERT IT JIFFY**

Simple to build; an outstanding performer for competition or sport. NOTE: The Humming Bird is the ONLY MODEL DESIGNED TO FLY AS A BIPLANE OR MONOPLANE! ★ Removable power unit ★ Ready cut notched ribs ★ M & M Pneumatic Wheels ★ Semi-carved Propeller ★ Full size plans ★ Colored bamboo paper ★ Berryloid Liquids ★ Plans only 50c. 100% complete Kit postpaid. **\$3.95**

POLK'S 1st AGAIN WITH THE IS ATOM THE WORLD'S LIGHTEST PRODUCTION ENGINE MADE!

Runs Upright or Inverted
Super-charged performance! Outpaces, outpicks engines of much greater displacement. Weighs scant 2 oz. with plug and tank. Molybdenum chrome steel cylinder & piston. Lapped to 1/10000" (one ten thousandth) of an inch accuracy. Flies models up to 2 pounds. **\$12.50**

ATOM illustrated booklet with 18 drawings and all details, send 6c stamp.
ENGINE & PARTS CATALOG
Features 100 gas model kits; 35 gas engines, 1000 accessories and fittings; 200 wood sizes. Yours for 6c in stamps.

POLK'S 429 Seventh Ave., Dept. M-8
NEW YORK

if smaller rudders are used as the model has a strong dihedral stability. When six inches dihedral is used with smaller rudders it has a tendency to rock once or twice when upset by gusts before assuming smooth flight.

Flights tests with the new changes were carried out with full power of 18 strands of 1/4" rubber. To keep the model inside the small field, only a portion of the motor was used. The idea is to divide the motor into two sections and hold them together with a wire ring. The front portion is 1/3 of the length and rear is 2/3. All we need now is a pin through the fuselage at the point where it can be inserted through the ring and prevent turning. A good pin-fitting on the fuselage is to cement two large face bushings to the sides if the fuselage is balsa covered, which stunt is similar to the idea used on bulkhead No. 13. To use only the front motor, wind up until the slack is taken up, shove the 1/16" wire pin through the ring and you are all set to use the front portion only. Now you can carry out full power tests with only 1/3 of the power time, just enough to keep the ship in the field.

(In testing, the nose plug dropped out once and heavy nose plug and propeller tangled up in rubber and started a spin. The model took on the nose, so be sure that your propeller stays in place during the glide.)

Propeller Assembly

The propeller is carved from balsa which can be used for anchors. It will require a hunting knife but it will last indefinitely. The prop was carved as it is preached to be, the blank being cut exactly on the lines so that it balanced. The lower camber has a definite curve. This was done by first carving the lower portion absolutely flat on the helix. Then a line was drawn 1/3 back from the L.E. Now the camber was cut first from the front to the depth required. Finally the rear portion was done in similar fashion. If both blades are carved following such procedure, the uniformity is assured as checking is by degrees. The upper camber was then carefully carved to produce the airfoil; so that it can be truthfully stated that the blades do have the section given. If you work in this fashion, the prop will balance in all stages of equal finish. Although a solid spinner was carved to fit, a much simpler method is shown so that you will not hedge away from spinners. It is just a matter of cementing a disk above and below and then planking. The tip is fixed to the shaft and is made of solid balsa since it does not have to be cut to special curves.

The nose plug is rather heavy on the original model since it was designed to be used with twin motors. The many gadgets are shown in the drawings and you will have to judge sizes to fit. The rubber tensioner uses a rubber band for tension. The wire portion should be made to slide smoothly inside the tube. Note that the front plug is cut from the first bulkhead which provides perfect fitting. The hook portion also has several features. Note the curved portion which provides a starting point and end for a winding rubber band which closes the

hook. The cambric tubing will keep rubber from tearing and the rubber tube, an English innovation, will prevent climbing. 5/16" elastic tube will do.

The final step in the prop is to cut it to outline. If the blank is curved on diagonals only the tip need be shaped to an elliptical shape. It might be mentioned here that the prop is cut-in on the center before carving to provide an almost neutral angle of attack which helps in using power for the mid-portion where it does most good. Of course the blades are highly sanded, silked and doped several times.

Landing Gear

The idea of this type of landing gear originated with Frank Ehling but it had to be modified considerably to suit conditions. His original idea was to use the special bend in the wire in conjunction with stops and a rubber tensioner fixed to the lower portion of the curve so as to pull the landing gear towards the nose. This would provide regulated shock absorption, but the idea did not prove practical with 1/16" wire on such a heavy model. If the rubber tension was too strong the wire would bend. Hardwood fairings made it bend just at the beds, so it was necessary to cement a wire hook into the nose and solder small guy wires to the landing gear. All that is necessary for easy packing is to slip off the guy wires from the hook and the landing will fold back.

Note the idea on wheel hubs. This does away with laminations and brass bushings. In making the landing gear and other wire parts be sure to file the ends smooth as heavy gauge wires have a bad break even if filed all around before bed-broken.

The Floyd Mirro-Film

We offer the only covering on the market that has a special weight for each of the classes of gas models under the new rules, each with the appropriate weight and strength. Types "A", "B", and "C" for classes C, B, and A, respectively. Also Type "D" for rubber powered models. Each type is available in Red, Orange, Yellow, Blue, Grey, Black and White.

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Sheets are 24"x36" at 65c each, postpaid, or at your dealer.

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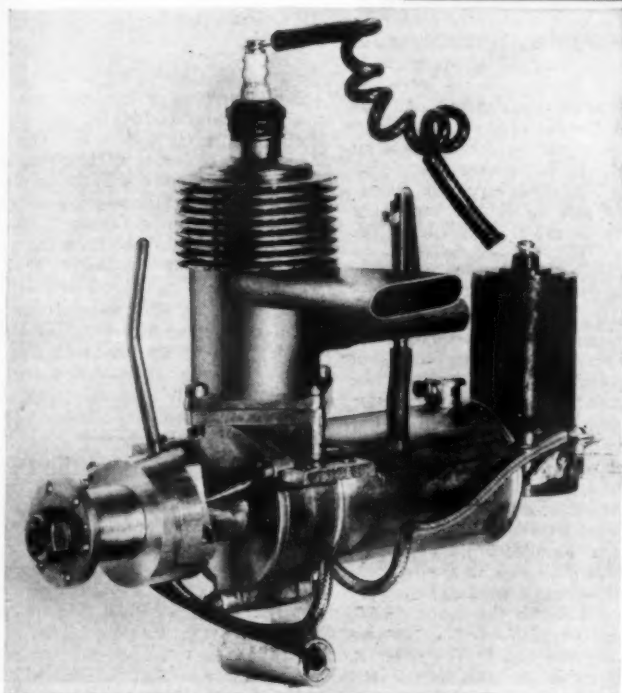
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W. Easterday, Los Angeles, California.

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MOTOR SPECIFICATIONS

Displacement .60 cu. in. or 9.9 c.c.—15/16 Bore—7/8 Stroke
—4 Port—2 Cycle—1/4 Horsepower—Weight Bare 8 oz.

THE JAMES MOTOR IS PRECISION
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HIGH SPEED. ACTUAL
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THIS PLANE IS A CONTEST WINNER and is perfectly balanced, precision built, and can be assembled by anyone very quickly. It comes with all parts accurately cut, including silk and hardware. The plans and specifications in this kit are full size. It has a 5-foot wing span. The regular price is \$5.00.

Your Price.....\$3.65 Post-paid

De Luxe Combination

James Motor, Value.....	\$21.50
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Hi-Rev. Precision 13" Prop., Value.....	1.50

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"Boy! What a deal."

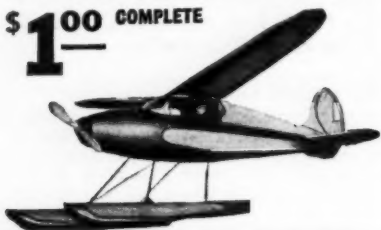
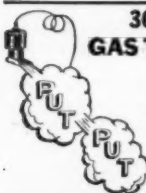
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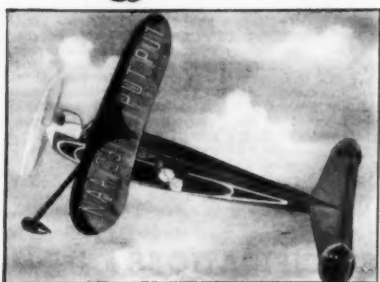
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FLOATS and SKIS, for any weather.

A long run over the rippling water, a slight lift of the wings and she's off climbing steeply into the blue skies. It's a real summer sport flying the BURD Skeeter at your favorite swimming hole this summer. It's easy to build, the set is complete, and it is a thrill to fly. Get this model at your BURD dealer.

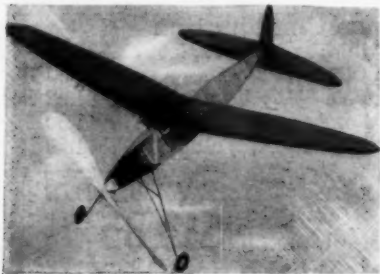
\$1⁰⁰ COMPLETE**36" WING SPAN
GAS TYPE—MOTOR PUT**

Looks exactly like a real gas model. Set includes turned dummy gas motor with directions for making a one-bladed, "no drag," fold-back prop.

75c**The 30" THERMALIDER**

Sold for two years at 50 cents, now re-designed and introduced in a new series for 25 cents. The BURD Thermalider has provided flying satisfaction for many model builders who previously had never known the thrill of successfully flying their own model. Easy as A B C to build. It's a cinch to be a sure-fire

flyer. Add 15c charge if ordered direct.

25c

SEE INSIDE FRONT COVER PAGE.

BURD
MODEL AIRPLANE COMPANY
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Wing And Tail Fixing

The wing and tail are held in place with small size rubber; 1/16" is very good. It was found that small rubber can be used much easier on the hooks and the job is much better because the knots are small. Be sure to use many tight loops and distributed over the surface for this will be appreciated when the fairings fit snugly. Note how the wing hooks are sunk into the fuselage and bend so that they will not cut into the wing. The covers, as it was mentioned before, are cut after the fuselage is completely finished and the openings for the surfaces are cut to fit. As you can see, the covers are held in place with Scotch Cellophane tape which provides a strong and very neat fixing. You can see that no rubber bands are visible except on the trailing end of the stabilizer.

Finishing And Power

The model is sanded smoothly all over before covering and is covered with standard paper and given two coats of dope. Be especially careful to have the paper stick to the undercamber. Use regular cement if necessary. Of course the grain runs span-wise.

The model will fly on any power from 18 strands of 1/8" to 18 strands of 1/4". It flew on the very first try with the C.G. at about 50% of the chord. The motor is inserted by first fixing it to the prop hook and then pulled through with a wire hook. As it passes the No. 13 bulkhead the wire pin is passed through the loops. Note how the tube-strength idea is carried throughout the fuselage by the covering of the wing cut-in as well as the tail opening. It is important that you do these things, especially if high power is used.

Flying is more or less left to your experience as the model has sufficient inherent stability to make adjustments unnecessary. The incorporated thrust adjustments and possibly just a wee bit of right rudder will complete the job. You will find the ship fairly fast under all power conditions. Be sure to work up the

winds gradually so that you will be able to check its spiral stability. Winding the 18 strands of 1/4" is a job, so be extra sure of the winding hook since the enormous power is liable to pull it out of the chuck. It was found next to impossible to break such large motors so give them "the works." The stated 900 turns were a bit over the table but they were achieved with a bit of teeth grinding.

Conclusion

Although you might not make the model, a careful study of the drawings should help you with many new ideas. The "New Yorker III" has special memories attached to it. It won a second place in the Paris Exposition contest and netted 1,000 francs (about \$37.00) just when it was needed most. It just so happened that on our way back to New York we passed through Paris with still ten days before the ship sailed from Southampton, arriving with but \$7.00 and still a long way to go. So with this extra money we were able to visit friends in Belgium, Holland and return to London with a North England visit.

Uncle Sam Turns to the Bomber

(Continued from page 7)

"From the last war we learned that short flights just over the enemy lines, bombing troop movements and ground operations were more effective than the carefully planned bombing raids on cities or strategic points far behind the enemy lines.

"Thus, you can easily see the need for the new type bombers. They will be capable of quick, short, striking thrusts at the enemy from high altitudes, and at the same time will be impregnable to all other attack planes except the fastest of the modern pursuits."

If acceptance tests prove successful the army expects to purchase at least 100 of the new planes. Probabilities are that all three companies will get orders. According to factory estimates this number of planes could be in service within eight months, as

UNBEATABLE Gas Models!

**The Commander**

A fitting name because its big 6 foot wing-span makes her stand out, ready to meet and defeat any competition. Takes any 1/4 to 1/2 horsepower engine . . . weight 3 1/4 lbs.

Kit (less motor and wheels) \$5.50
DeLuxe Kit, including silk and air wheels \$7.50

The Kestrel

Here's a 50 inch wing spread flier that will match inch for inch with any plane twice its size. Put in a contest and walk off with a prize. Made for 1/20 to 1/7 horsepower engine.

Kit (less motor and wheels) \$2.95
DeLuxe Kit, including silk and air wheels \$4.50



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on more gas and
rubber
models**

PARAMOUNT Model Plane Co.

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COMPLETE KIT

\$5.

ASSEMBLED
\$10

Everything is in the kit including Champion spark plug, Winston coil, condenser, tank and cap, ignition wire, cylinder, piston, connecting rod, timer, crankshaft, all screws, nuts, bolts, complete instructions, etc. Every part is fully machined and finished. No oil, gas, batteries, or propeller included. A SCREWDRIVER IS THE ONLY TOOL YOU NEED.

EXACTLY THE SAME PARTS THAT GO INTO THE G.H.Q. ASSEMBLED ENGINE

AN ENGINEERING TRIUMPH . . .

Never Before at So Low a Price!!

Indeed an engineering triumph—accomplished by outstanding G.H.Q. designers and engineers, who have constructed into the G.H.Q. motor everything that years of exhaustive scientific aerodynamic research could produce—geared to the highest possible degree of perfection. But more than that, the acid test . . . an overwhelming response. Thousands of users in all parts of the country are praising, recommending, and endorsing this scientific achievement. It seems as if everyone in America wants one. The most hair-raising thrill you've ever experienced will be yours with the G.H.Q. motor—actually one of the most powerful motors ever constructed. Has broken records for amazing performance . . . and just imagine—flies model planes up to 10 foot wingspread. AND JUST AS EFFICIENT FOR BOATS AND STATIONARY USE. Easy to start and simple as ABC to assemble.

ALL PARTS GUARANTEED



Average Assembly Time 30 Minutes

THE ONLY ENGINE WITH A WARRANTY—APPLIES TO BOTH ASSEMBLED ENGINES AND KITS

Over 7000 of these same famous G.H.Q. Gasoline Engines have been sold at \$8.50. Mass production methods and enthusiastic reception have enabled us to reduce the price from \$35 originally TO THE NEW LOW PRICE OF \$5.00.

The new 1939 model now for sale includes the new unbreakable steel stamped piston giving high and perfect compression.

SPECIFICATIONS

4 Port 2 Stroke Cycle. $\frac{3}{4}$ " Stroke. $15/16$ " Bore. 300-7000 R.P.M. Turns 14" Prop. 8" Pitch. Bearing Surface, $1/4$ " Long. Crankshaft, $5/16$ " Diam. Weight, 10 oz. (Motor) Rotation, Either Direction. Height, $4\frac{1}{2}$ "—Width, $2\frac{1}{2}$ ", H.P. Approx. 1/5th.

DEALERS!

The G.H.Q. MOTOR KIT and the new low-priced

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are sweeping the country. Get your share of this business!! Our new discount schedule gives larger dealer discounts than ever before!

Write in Today!

WHY HANDLE G.H.Q.?

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2. Attractive discounts.
3. Nation-wide advertising.
4. Free circulars for imprint.
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6. Full manufacturers co-operation.

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"I would like to say that I am very much satisfied with the results my customers have had in assembly and running of your motor kits. I have sold to date all but one of the engines which we have purchased from you, and they are all running successfully."

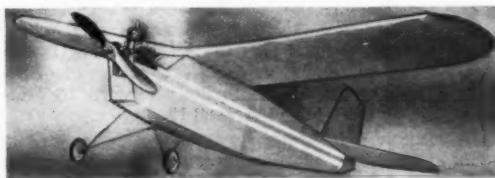
MODEL BUILDERS GUILD, 81 Lawrence Street, Hartford, Conn.:

"Your engine here in the city is popular with the boys and we expect to sell them very fast this summer; that's why we have started to buy them by the dozen."

THE ROBOTAIRE

A new trim, streamline gas model plane. 5 foot wingspan.

For Large & Small Bore Engines.



Small and light enough to take any engine in the market, and rugged enough to take engines up to 1/3 horse-power, the **ROBOTAIRE** was especially designed for the G.H.Q. Engine on which it has been flight-tested for over 100 hours in the experimental model. Construction has been planned so that even a beginner can build the **ROBOTAIRE** easily and quickly. Plans and instructions are detailed and simple.

Kit is absolutely complete including plans, bamboo paper, wood, wheels, metal motor mount, cement, dope, etc.

Order your **ROBOTAIRE** today and enjoy the thrill of flying a 1939 designed gas job.

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G. H. Q.'s FIFTH YEAR!

Thousands of Satisfied Users! Read some of these testimonials on file with us:

J. B., Providence, R.I.—"A few weeks ago I received the G.H.Q. motor kit and it is running perfectly. I hope to write you soon and tell you about some excellent flights."

R. H., Prairie du Chien, Wis.—"Your motors sure can take a lot of abuse and knocking around and yet perform perfectly. I have had two in a period of about two years and have seen higher priced motors give less service and performance."

W. W. M., Russellville, Ark.—"I received my G.H.Q. Motor Kit and am very well pleased. I had motor together in 1 hr. 40 min. I will place order next week for G.H.Q. Sportster Kit."

W. L., Claysburg, Penn.—"A wonderful motor that thrills any air-minded person. Strong and neat looking. As good as motors costing twice as much." A. K., Hillside, N.J.—"I still can't understand how you can put such a dependable and rugged engine on the market at such a low price."

E. T., Sayville, N.Y.—"Received my G.H.Q. Kit okay and am more than delighted with same. You've got 'em all beat for price and performance."

R. P., Hamburg, N.Y.—"I want to extend my personal thanks to G.H.Q. for their prompt service. The motor I ordered was received within 24 hours. Such service cannot be surpassed. I also want to say that I have the motor running perfectly. I shall do all I can to help promote the success of G.H.Q."

H. H., Midlothian, Ill.—"Motor assembled correctly and performs perfectly. I am fully satisfied."

L. N., So. Euclid, Ohio—"Received my finished motor. I am very pleased with it and runs fine. I will be glad to encourage others to get G.H.Q. motors."

C. C., Chicago, Ill.—"I received my motor and I am quite satisfied and surprised at the precision parts for the money."

E. E. F., Mare Island Navy Yd., Calif.—"I saw your offer of a complete G.H.Q. Gas Engine Kit for only \$5 in the August issue of Mechanix Illustrated. I have just cracked up the G.H.Q. that I bought this spring. It had over 50 hours on it, and I have had very little trouble with it, and made my own repairs whenever the engine needed them. As I was glancing thru the magazine, the ad struck my eye. At that price I will be able to pursue my favorite hobby again, gas power models."

THE G. H. Q. GAS
ENGINE CAN BE
USED IN BOATS
MIDGET CARS & PLANES
WITHOUT ANY CHANGES

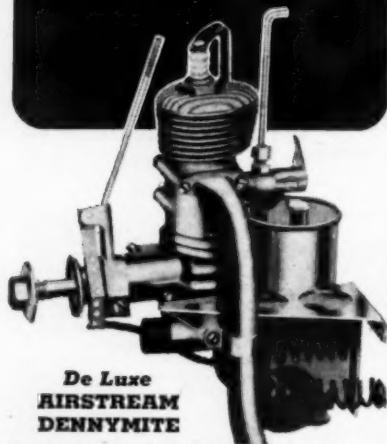
The G.H.Q. Gas Engine sold four years ago for \$35. Today, you can secure a vastly improved engine kit for only \$5. How is this possible? Simply because we have invested thousands of dollars in tools, jigs, dies and equipment to produce the only mass-production motor in the market. All parts are uniformly perfect.

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IS HAPPENING**

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ASK YOUR DEALER
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YOU CAN HEAR
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Complete with coil, condenser,
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Same as Standard Airstream less
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**REGINALD DENNY
INDUSTRIES, INC.**
3731 HOLLYWOOD BLVD • HOLLYWOOD, CALIF.

the construction of all three is such that mass production could be easily accomplished.

The entire upper portion to the fuselages on each of the planes is composed of transparent, shatter-proof glass panels. The outside skin of all three is held together by flush-rivets, an innovation in aircraft construction designed to eliminate the drag caused by protruding rivet heads. The wings of each of the ships are full cantilever and fuselages are of all-metal, semi-monocoque construction.

Most radical design is that of the North American model designated as the NA-40B. This ship is a high-wing monoplane which incorporates a new type of motor mounting for its two 1350 horsepower Wright motors. The motor nacelles hang entirely below the wing, although they are actually built into the wing structure. The ship also has a twin rudder arrangement similar to that in use on all Lockheed planes.

The wing span on the North American is 66 feet. The ship clings close to the ground because of its tricycle landing gear, a feature which soon may be incorporated in all military planes, since the army is responsible for its design. Hydraulic mechanisms operate the tri-wheel undercarriage. However, when the ship lands the front nose wheel does not come down with the two landing wheels, but follows the others just before the nose of ship hits the ground.

Armament features of the North American, a delicate subject with the army, include a front nose turret which is directly forward of the pilot's control station. There is also a gun turret in back of the pilot compartment on top of the fuselage. The ship will depend upon its speed and maneuverability for protection from attackers rather than upon strong armaments.

Reports are that the plane carries a crew of three with a bomb load of approximately half a ton. It has a gross weight of nine tons.

Although no reports on its performance can be obtained because it is a competitive design and army restriction forbids release of such data, the ship is reported by authoritative sources to have a speed of approximately 320 miles per hour. Its probable ceiling is around 15,000 feet.

Unfortunately, however, about two weeks after the North American bomber came here army officers and engineers saw what reminded them again of the famous "contest of the three" mentioned above. They saw this radically designed ship, the plane they had hoped so much would prove "just the thing," plunge to earth in flames. Luckily this time the crew walked away with only minor injuries.

What caused the crash has so far been kept a military secret, but rumors say it was due to "man fault." This starts something because only ten days previous and not five miles distant from where the bomber took its fatal plunge another of the army's experimental ships, the Seversky P-41, crashed and burned. The same rumor still is about regarding the pursuit plane crash.

Observers who saw the crash say the \$500,000 attack bomber of the North American Corporation was flying along at 600 or 700 feet when something apparently went wrong. They said the pilot then tried des-

perately hard to land the ship at Wright Field, missing it by only a short distance. When the plane was only ten or fifteen feet above the ground, coming in on a glide, observers say, she suddenly plunged to earth and burst into flames.

Those split seconds between the actual impact and the burst of flames were enough for an act of heroism on the part of a crew member. He happened to be the first out of the ship and it was his assistance in getting open an emergency hatch that enabled his fellow men to climb out to safety.

The three officers who were testing the ship were Maj. Younger Pitts of Barksdale, California; Lieuts. George F. McGuire and James W. Anderson, Jr., also of March Field. They had come here from the combat group to take part in the acceptance tests of the bomber.

To many who are acquainted with the procedure which heretofore has been the program of testing with the army this step seemed unwise. Test pilots, and expert engineers at the Wright Field laboratory have always in the past handled testing of new planes. Some pointed to this as basis for the rumor about "man fault" but one quickly quenches this when it is considered that the officers who have come in from the actual tactical units are themselves the best trained pilots Uncle Sam can produce. Test pilots at the Division were all at one time or another acting personnel in some of the tactical squadrons.

Up until the time of the crash reports were that engineers had been greatly impressed by the North American and were looking forward to its acceptance into the Air Corps. The crash greatly upset the chances of this entry in its part in the air corps expansion program. However some sources indicated that the plane might yet be purchased, despite the unfortunate accident. Orders for the Seversky P-41 have already been placed by the Air Corps. This was also true when the army bought the "Flying Fortresses" in face of the fatal crash resulting in a test flight at Wright Field.

Although estimated at a half million dollar loss the crash of the North American did not cost Uncle Sam anything. Neither did the crash of the XP-38 nor of the Seversky P-41. It is interesting to know that every plane which comes to Wright Field for testing is first insured by the company which it represents. True, the insurance rates are high, but companies stand back of the losses.

In the case of the North American more than \$1000 an hour was paid in insurance premiums, but since the plane had only a limited number of flight hours to its credit the insurance company lost a great deal of money on the deal. The B-15 costs as high as \$7000 a day during its six months testing here, but the Boeing company was protected on a million dollar investment while the plane was being subjected to the rigid program of military testing.

The Boeing (Stearman) is also a high-wing design with a conventional two wheel landing gear which retracts into the engine nacelles. This ship is powered with twin Pratt & Whitney 1400 horsepower engines. Although its motors also are beneath the wing the nacelles are not built flush with the top of the wing camber.

AIRPLANE KITE

"You'll get a thrill if you catch a thermal"



K-48 MONOPLANE

48" wing spread—33½" length

This is a monoplane kite that will outfly any model you have ever seen in the air. It's something new that is bound to win popular favor.

Retail 50c mailing charge 20c extra

CONSTRUCTION SETS



K-30 MONOPLANE

30" wing spread
20" length

The latest addition to our popular kite models. If you are looking for the thrill of an endurance flight, you should not overlook this number.

Retail at your dealers 35c
Postage 15c Additional
2 for 65c postpaid U.S.A.

"You'll get a thrill if you catch a thermal"



K-48 BIPLANE

48" wing spread—33½" length

A big brother to the K-48 monoplane this biplane looks like the real thing! We guarantee that after flying one, you will agree that it has no peer in the air.

Retail \$1 mailing charge 25c extra

NEW GAS TYPE FLYING MODELS (Rubber Powered)



GT1—"CUB" (Illustrated)

Wing spread 36". Overall Length 23½". Weight 2 oz.

GT2—"MERCURY"

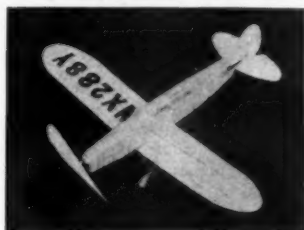
Wing spread 36". Overall length 24½". Weight 2 oz. These kits meet the demand for inexpensive rubber-powered flying models that look sound and fly like real gas jobs.

Complete Kits (No Liquids) Each.....**50c**
Mailing charge 15c.

GT3-GIANT 50" ENDURANCE MODEL

Overall Length 37½". Weight 3 oz.

The superior quality and correct aerodynamic design of this model makes it one of the outstanding buys of the season. A dandy flyer! Complete Kit (No Liquids).....**50c**
Mailing charge 15c.



New 24" Models

Complete with Liquids

- No. 81 TORPEDO
- No. 82 HORNET
- No. 83 WASP
- No. 84 CYCLONE
- No. 85 INTERCEPTOR
- No. 86 MERCURY JR.

Retail at your dealers 25c
2 for 65c postpaid U.S.A.

3 0" FLYING MODELS



SERIES DK30

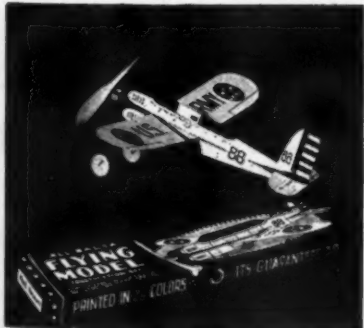
- | | |
|-------------------|--------------------|
| 191 Kinner Envy | 197 Taylor Cub |
| 192 Rearwin | 198 Endurance |
| 193 Stinson SR 80 | 199 R. O. G. Scout |
| 194 Bellanca | 200 Cessna |
| 195 Aeronca C3 | 201 Waco Custom |
| 196 DeWittine | 202 Curtiss P-38 |

(NO LIQUIDS)

Retail at your dealers 25c
2 for 65c postpaid U.S.A.

2 New 10c Items

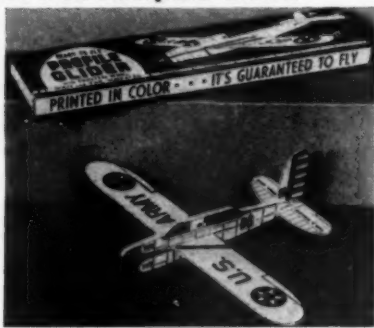
1 of Each or 2 Assorted for 30c Postpaid U.S.A.



ARMY PURSUIT

An all Balsa Flying Model Construction Set, colorfully styled with wing, body and rudder printed in red and blue.

Retail at your dealers 10c



ARMY GLIDER

An all Balsa ready-to-fly glider with the profile of a real military plane. Wings, body and elevator printed in red and blue.

Retail at your dealers 10c

Boys!

**WRITE FOR
PARTICULARS
ABOUT OUR
NEW 6 Ft. GAS
MODEL**

IT'S SENSATIONAL!

PAUL K. GUILLOW

WAKEFIELD, MASS.

BUD WARREN Says:

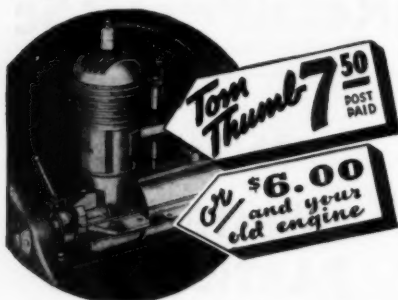
"I still have the world's biggest value" the Tom Thumb 1/5 h.p. gas engine



"MY CUSTOMERS ARE SATISFIED CUSTOMERS"

SPECIFICATIONS and HOW to BUY the NEW TOM THUMB

The Tom Thumb is the most powerful easy starting 1/5 H.P. engine made. Clip the coupon below, enclose money order for \$7.50 (also your old motor for special \$6.00 offer), and receive a brand new assembled and block tested Tom Thumb. Complete with fuel tank, coil, Champion spark plug, one piece cylinder and head and other modern features. Complete flying weight 10 oz. (less batteries). Bore 7/8"; Stroke 3/4".



WARREN SALES & SERVICE
412 Brett St. Inglewood, Calif.

☐ Rush me one new Tom Thumb Engine. I enclose \$7.50.

☐ Rush me one new Tom Thumb Engine. I enclose \$6.00 and my old engine (any make) including all parts regardless of condition.

I intend to run my Tom Thumb—
☐ Upright ☐ Inverted

Street _____

Name _____

City _____ State _____

A unique feature of the Boeing is its electrically controlled tail wheel and its new design nose. The tail wheel and the undercarriage are controlled by electrical mechanisms which makes the plane unlike its two competitors, the Martin and the North American, inasmuch as these ships have hydraulic-controlled landing systems.

Designated as the X-100 the Stearman has a wing-span of 65 feet, an overall length of approximately 52 feet and stands 12 feet above the ground. It weighs nine tons gross and has crew accommodations for four men.

The Stearman has a single rudder and is more of a box-like construction than either of the other two planes. The gunner sits in the nose and from here also controls the bombing operations. Other armaments include a turret on top of the fuselage to the rear of the pilot and one underneath.

Flight tests at the Stearman plant in Wichita, Kansas, have proven the plane to have ideal flying characteristics. The ship has an estimated speed of "well in excess of three hundred miles per hour."

Before bringing his entry to the field Glenn L. Martin, famous plane designer, said that the "New Martin bomber is one of the cleanest designs ever turned out by the Martin Company. It is capable of speeds which may make it the fastest bomber of modern times."

This designer was the man who several years ago introduced the mid-wing Martin B-10's and later the B-12's which revolutionized the bombing plane. At that time the Martin planes were the fastest bombers in existence. They gave the Air Corps engineers something to shoot at and, because of their great speeds, practically rendered all pursuit ships then in service obsolete.

When the new Martin, which is known as the Martin-167, came to Wright Field for testing those who saw the ship were amazed at its likeness to the "Flying Fortress." It is similar in many ways to the giant ships, however, it is only powered with two motors instead of the four power units which line the wing of the B-17's. Two Pratt & Whitney 1100 horsepower engines furnish the power for the Martin all-metal, mid-wing monoplane. The ship has a gross weight of eight and one-half tons and can carry a crew of three.

The wing span is 61 feet, four inches, and its over-all fuselage length is 48 feet, 6 inches. It is the only one of the three ships entered in the competition which is already equipped with de-icing devices,

which may indicate that it is also equipped for high altitude flying. The Martin also has a nose turret which is directly in front of the pilot's cabin. However its design differs greatly from either the Stearman or the North American, for its pilot cabin is very similar to that of an ordinary transport plane. Its mid-wing design is a feature of all Martin planes.

All of these ships are equipped with full-feathering, three-bladed propellers. They are the latest that Uncle Sam has to offer in bombing planes.

The test pilots who will report on this newest type of fighting plane are Maj. Paul L. Williams of Barkadale Field; Maj. Walter R. Peck of March Field; Maj. Stanley M. Umstead of Wright Field, and Capt. Ernest H. Lawson of March Field. The name of the fifth one was not learned.

What will become of the giant bombers?

That is the question which aeronautical experts are asking since the army has suddenly become so seriously interested in the new attack planes.

The giants will still remain. They are America's greatest defensive weapon, but their defense is of an offensive nature. That is, to be a protector they must be an aggressor.

To clarify this one need only recall the words of Orville Wright, the co-inventor of man's flight, when he said:

"We thought the airplane would help to prevent war by bringing the horror and tragedy of it closer to home."

These great bombers—the "Flying Fortress"—and the giant "Super Fortress"—the B-15—could carry war to any nation on earth. They could bomb Berlin, Moscow, Tokyo or any city whose country might make war upon America.

But we have never been an aggressor nation, so consequently the Air Corps looks to the light bomber for better defense just in case an enemy should attempt invasion on American soil.

These new fast bombers will bolster attack aviation into the front line of defense. Backed up by the mighty bomb-carrying giants they stand as a warning of Uncle Sam's defenses to the rest of the world—and here is proof that he isn't bluffing.

Summer Subscription Offer
On Page 3 Expires Aug. 8th.
ACT NOW!

WHEN "SECONDS" COUNT

USE FAMOUS **DDXR** SPEED FUEL

CARBURETOR ACTION

HIGHER ALTITUDES — LONGER GLIDES
FOR CONTEST AND EVERYDAY FLYING

MORE TRACK SPEED

SEE YOUR DEALER OR WRITE DIRECT
FOR CAN AND FORMULA

DEALERS: WRITE FOR ATTRACTIVE PROPOSITION

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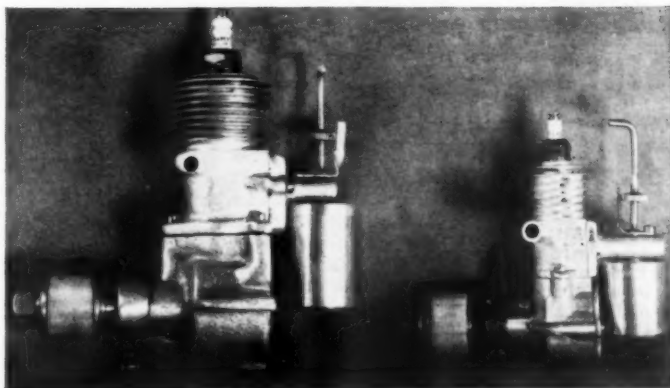
20 YEARS EXPERIENCE

BELMONT MOTORS*Presents*

THE MOTORS OF TOMORROW

THE BELMONT - - - - \$9.95**THE GNAT - - - - \$7.95***Smoothest Motors on the Market!*NO POWER
WASTENO
STUTTERING**SPEED****POWER****ACTION***Your order shipped the day
it is received***THE BELMONT**

Bore $\frac{7}{8}$ "
 Stroke $\frac{15}{16}$ "
 R.P.M. 8,600
 Weight 9 Oz.
 H.P. $\frac{1}{4}$

**THE GNAT**

Bore $\frac{9}{16}$ "
 Stroke $\frac{5}{8}$ "
 R.P.M. 7,500
 Weight $4\frac{1}{2}$ Oz.
 H.P. $\frac{1}{10}$

**3 BIG
ADVANCES***Greatest in Model Motor Building***1—STARTING—**

Positive Starting—No Time Lost In
Useless "Cranking"—Gets Your
"Baby" Into the Air.

2—OIL SYSTEM—

Revolutionary Design—Protects Your
"Points"—No Fouling.

3—GAS FEED—

Belmont's Exclusive 90° Feed Insures
Smoothest Motor on the Market—
Order Yours Today.

BELMONT MINIATURE MOTORS**23 MINER STREET****BOSTON, MASS.**

BUILD ONE IN A COUPLE
EVENINGS AT HOME



Megow's COMMANDER

Gas-Powered MODEL

\$4.95 plus 20c postage

FASTER and faster come new ideas from the experimental field and experimental laboratory work of Megow engineers . . . ideas that are producing the most interesting easy-to-build and easy-to-fly models in the world. If you really want to learn the principles of flying—without spending too much time on tedious details—build Megow models!

See your dealer, or send for new Megow catalog showing the latest championship gas and rubber-powered models and such advancements as Megow's hollow-carved and finished Leading Edge, revolutionary monocoque (skin construction) fuselages that are so easily and quickly built, PLANEFILM Magic Covering . . . everything that's newest in Model Airplanes, Ships and HO-Gauge Railroads.

Send 5c postage today for your copy of the new Spring and Summer Catalog

Megow's

Dept. MA, Howard and Oxford Sts.,
Philadelphia, Penna.
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or Great Western Mfg. Co.,
718 Mission Street, San Francisco

MODEL AIRPLANES • SHIPS • HO-GAUGE RAILROADS

can be presented to the Contest Board of the N.A.A. without further notations or additions.

A supply of both forms is available to all Contest Directors in good standing. Address such requests to Model Division of the National Aeronautic Association, Dupont Circle, Washington, D.C., including 6c in stamps.

Good News For Gasoleers!

According to the large number of "promises-to-insure" which are being received daily at the headquarters of the N.A.A.'s Gas Model Division in Washington, insurance is going to be available to gas contestants in the near future.

You know, this plan was originally shelved because 500 fellows didn't want to part with \$1 until the other chap did—and, well, the result was not enough insurance applications were received to permit the excellent plan to go into effect and have policies issued.

When this was announced, of course, lots of folks said "Well, I would have applied had I known that was the case. Here's my promise, let me know when insurance is available."

If you hold a gas model license and haven't yet signed one of these "promises-to-insure" and want such protective insurance coverage, fill out the correct form and mail it immediately to Washington. If you haven't a form ask headquarters for one. Come on now, everyone, get behind this insurance program. It's for your benefit!

International Competition In Norway On September 3, 1939

What do you expect to be doing on the third of September, this Fall? If you plan to be in the vicinity of Norway this item will be of especial interest. And even if you can't make the competition, it is encouraging to note another international meet on the horizon.

The Academy of Model Aeronautics makes public the following invitation from the Norway Aero Club:

"National Aeronautic Association of U.S.A.,

Washington, D.C.,
Dupont Circle.

Invitation to the International Model Aeroplane Competition on September 3rd, 1939.

The Norsk Aero Klubb begs to invite the members of your Club to take part in the international model aeroplane competition at Kjeller near Oslo on Sept. 3rd at 12 o'clock. The competition will be held according to the rules of F.A.I.

The competition will have one class only with wingspan from 70 cm. to 35 meters.

There will only be rise off ground start. The average time of three flights decides the order of prizes.

There will be a wandering Cup for the best members. The cup must be defended in Norway every year and must be won three times before it becomes the winner's property. There will also be a second and a third prize.

The last date for inscription (entry) is August 1st, 1939.

N.A.A. News

(Continued from page 20)

sentiment when it made the decision.

In conjunction with the ruling the A.M.A. states:

"In the glider events where nine flights are permitted with no delayed flights allowed, the three highest officially recorded 'times' should be totaled, and divided by 3 to obtain the 'three-flight-average' duration for contest and record application purposes.

"In the standard categories, where three flights are permitted and where the 'three-delays-constitute-an-official flight' ruling is in effect, in the event a delayed flight exceeds the time of an official flight, in totaling the three official flights, the delayed flight shall replace the official flight which it exceeded."

Enlarged Model Division Requests Cooperation From Directors to Speed Its Work

The newly reorganized and enlarged Model Division of the N.A.A. which is now set up to provide more aid to leaders in the field and prompt action on memberships, asks that all official contest directors, when sending into headquarters reports on sanctioned competitions, use the form provided for that purpose by the Model Division.

Also, when applying for national records on behalf of aeromodelers making record-breaking flights, directors are requested to fill out the official form which

THE NEW
MERCURY
GAS MODEL BY SCIENTIFIC
See Page 37

THE BEST ENGINES

On The Market Depend For
Their Performance On A

SMITH Ignition Coil



You too can benefit from their experience by replacing with the genuine article. New primary terminals, mounting brackets and fibre strap, clip connectors on lacquered High-Tension wire, weight 2½ oz.

Price \$2.50

Save weight and win the contest with our NEW Model LIGHTWEIGHT coil.

Beautiful Bakelite case and same high-tension leads as our other coils. WEIGHT 1¼ ounces. Price \$3.00.

If you must have a big coil get our 5 ounce BIG SHOT that outperforms all others. \$3.50.

NATHAN R. SMITH MFG. CO.
1234 West 8th St., Los Angeles, Calif.

The number of competitors from each country is unlimited.

The Aero-Club of Norway will help to find lodging for the guests.

Yours truly
Norsk Aero Klubb,
(signed)
President."

Schedule of N.A.A.-Sanctioned Contests

July 15—Gannett Newspapers sponsoring a National Aero Reserve Western N.Y. Meet at Genesee Valley Park, Rochester. Merchandise and plane rides. John L. Scherer, director, Gannett Newspapers, Municipal Airport, Rochester, N.Y.

July 16—Portland Gas Model Club sponsoring gas meet at Portland Gas Model Airport, Merchandise. Harry N. Fosbury, director, 5409 S.E. 92nd Avenue, Portland, Oregon.

July 16—Columbia Jr. Chamber of Commerce sponsoring rubber, gas, and scale meet at Columbia (Mo.) Municipal Airport. Merchandise and cash. Frank Lamb, director, Buchroeders Jewelry Co., Columbia, Mo.

July 23—All-event meet at Allegheny County Model Airfield, Pittsburgh. Merchandise. Harry G. Vogler, Jr., director, 303 Lowell St., Pittsburgh, Penna.

July 23—Omaha World-Herald sponsoring Midwest Gas Model Contest at Benson Park, Omaha. \$200 in cash, trophies and merchandise. L. B. Bush, director, 610 Redick Tower Building, Omaha, Nebraska. Rain date, July 30.

July 26-27—Mod-Kraff Company of New Orleans sponsoring Second Annual "Gulf States Model Air Meet" at New Orleans Model Airport, Milneburg. For information write to Contest Director, Gulf States Model Air Meet, 4506 Freret Street, New Orleans, La.

July 29—Linden Model Airplane Club sponsoring outdoor gas meet for state championship at Hadley Field under direction of Frank M. Krysiak, Board of Recreation Committee, Old City Hall, Linden, N.J.

July 30—Baltimore Model Airplane Association sponsoring the Second Annual Baltimore Model Airplane Contest; rubber and gas. Merchandise and trophies. William W. Saunders, director, 4303 Kathland Avenue, Baltimore, Md.

July 30—Veterans of Foreign Wars Local No. 775 sponsoring All-Iowa Model Meet to be held at Ottumwa Municipal Airport. Trophies and merchandise. Mr. C. P. Oleson, director, Municipal Airport, Ottumwa, Iowa.

August 7—Western State Gas Model Meet at Kent County Airport, Grand Rapids, Michigan. Merchandise. J. G. Vinkemulder, director, 3160 Reeds Lake Blvd., Grand Rapids, Mich.

August 12th: The annual Eastern States Gas Model Meet, sponsored by the Metropolitan Model League and MODEL AIRPLANE NEWS, will be held at Hadley Field, N.J. The meet will be directed by Nathan Polk, Irwin Polk and Charles H. Grant. There should be several hundred contestants present from various states. For complete information write: Metropolitan Model League, 429, 7th Ave., New York City.

MORE POWER



NEW Atwood PHANTOM MODEL "G"

No Increase in Price

PACKED WITH 10 NEW FEATURES

Bill Atwood announces his new 1/7 H.P. Phantom Model "G" which incorporates TEN OUTSTANDING ADVANCEMENTS... AND NEW, GREATER PERFORMANCE. Model "G" produces this new efficiency with an unbelievable S-M-O-O-T-H-N-E-S-S of operation. It is also far easier to start and runs degrees cooler.

1. Model "G's" increased power is achieved by a new development in port timing, insuring faultless 2-cycle operation up to 14,000 r.p.m.
2. New single piece, fully counterbalanced shaft with tubular pin.
3. New diamond-bored crankcase which guarantees absolute alignment.
4. Streamlined manifold producing a new and distinct "crack" to exhaust.
5. New 4-bolt cylinder mounting which eliminates distortion.
6. 7 1/2-oz. complete with 2 pen light cells.
7. Exclusive Dowmetal case.
8. Hardened steel timing cam.
9. Oversize bronze bearings as large as engines twice Phantom size.
10. Runs upright or inverted.

And remember all Phantoms are the biggest engines in their class, displacing .27 cu. in. under N.A.A. rules for engines up to .30 cu. in. displacement. Send for new folder giving specifications and complete installation drawings.

MEET MISS TINY

Get this record-breaking kit for your Phantom. 46" span. Kit contains EVERYTHING.



New precision, fully counterbalanced shaft, with rotary valve integrated, incorporates the new, exclusive Faucet Pulsation Principle of port timing.

\$9.75

complete
as shown

PHANTOM MOTORS, 800 East Gage Ave., Los Angeles, Calif.
Please rush prepaid the items checked below:

- | | |
|--|---------|
| <input type="checkbox"/> New Model "G" Phantom Engine complete with coil, tank and condenser..... | \$ 9.75 |
| <input type="checkbox"/> Special 11" hardwood propeller..... | \$.49 |
| <input type="checkbox"/> Miss Tiny Kit..... | 3.95 |
| <input type="checkbox"/> Phantom "G" Engine and Miss Tiny Kit with Propeller included as gift..... | 13.70 |

Add 3% for Sales Tax if delivery point is in California.

NAME

ADDRESS

GET A SCOUT KNIFE FREE!

... this three-bladed knife, complete with canopener, caplifter, screwdriver, etc., and many other valuable gifts are yours for the asking. With each \$50 purchase or over, you will receive FREE profit-sharing coupons that can be redeemed at any time at no extra charge for such worthwhile premiums as a penlite flashlight, binoculars, telescope, microscope, etc. REMEMBER!... prices and quality have NOT been sacrificed to bring these added values to you!

HEATHE APPROVED MOTORS

All motors carry double factory guarantee against defects in material and workmanship for 60 days... All motors and replacement parts in stock at all times.

BROWN JR MOTOR

The only unconditionally guaranteed motor, complete, ready to run with coil and condenser. The New Sensational Brown Jr.

Model "D".....\$12.50 Model "B".....\$21.50
Model "C".....\$18.50 Model "24" (Marine).....\$18.50
Postpaid

SYNCO BEE

1/4 H.P. Ideal for small flying models. \$12.50, post. \$13.75
Synco Special, 1/2 H.P. \$9.95
Synco Ace, 1/2 H.P. \$13.75

HEATHE MOTOR TRADE-IN PLAN

Send us your old motor and also the name of the motor you want and we will air mail you our appraisal value. Motor returned at our expense if offer is not satisfactory.

1939 "O.K." Engines

Special.....\$11.50 Marine D.....\$22.50
Standard.....\$17.50 Marine S.....\$13.50
Deluxe.....\$21.00 Inverted Ext.....\$1.50
All motors 1/2 h.p. wt. 7 1/2 oz. come complete with coil, condenser, etc., ready to run.

RUBBER MODEL SUPPLIES

18" Balsa
1/16x1/16.....100-5c
1/16x1/8.....35-15c
1/16x3/16.....18-5c
3/32x3/32.....30-5c
1/4x1/4.....10-5c
3/16x3/16.....6-5c
1/4x1/4.....3-5c

18" SHEETS
1/64x2.....4-10c
1/32x2.....8-10c
1/16x2.....7-10c
3/32x2.....7-10c
1/4x2.....6-10c
3/16x2.....3-9c
1/4x2.....3-10c

PROPS
1x1x18.....6-5c
2x1x18.....3-5c
3x1x18.....3-5c
3x1x18x12 3c ea.
3x1x18x12 3c ea.

M & M AIR WHEELS
For rubber powered models
1 1/2".....\$1.50
1 1/4".....\$1.50
1 1/2".....\$1.50
1 1/4".....\$1.50
1 1/2".....\$1.50
1 1/4".....\$1.50
1 1/2".....\$1.50
1 1/4".....\$1.50
1 1/2".....\$1.50
1 1/4".....\$1.50

18" PLANKS
1x1 5c; 1/2x2 6c
1x1 1/2 5c; 1x2 10c
1x1 1/2 5c; 1x2 10c
2x3 23c; 2x6 39c
3x3 40c; 3x6 75c

BAMBOO
1/16 sq. x 1/4
1/16x1/4 5c for 5c
1 doz. for 3c

CEMENT
1 oz. 5c; 2 oz. 9c
4 oz. 16c
1 pt. 50c
Clear dope, banana oil, thinner, same price as cement

COLORLESS DOPE
White, yellow, orange, blue, red, green, olive drab, black, silver, gold or gray
1 oz. 5c; 2 oz. 9c
4 oz. 16c; 1 pt. 50c

HIGH GLOSS
1 oz. 9c;
4 oz. for 25c

CELLULOIDE MOTORS
1 1/2".....\$1.50
2".....\$1.50
2 1/2".....\$1.50
3".....\$1.50

ALUMINUM WHEELS
1 1/2" per pr.....\$1.50
1 1/4" per pr.....\$1.50
1 1/2" per pr.....\$1.50

RUBBER-LUMBER MICRO-FILM WOOD-FILLER
1 oz. 10c 2 oz. 15c

TISSUE, AA
All col., dos. 10c
Superfine, white, 1 doz. 15c

WHEELS per pr.
1 1/2".....\$1.50
1 1/4".....\$1.50
1 1/2".....\$1.50
1 1/4".....\$1.50
1 1/2".....\$1.50
1 1/4".....\$1.50
1 1/2".....\$1.50
1 1/4".....\$1.50
1 1/2".....\$1.50
1 1/4".....\$1.50

ALUM. TUBING
1/16, 3/32, 1/4, 1/2, 3/4, 1 ft. 10c
1 ft. 7c
3/16, 1/4, 1 ft. 10c

PROPELLERS
Balsa Paulina Mach Cut wins 8c
8".....5c
7".....4c
6".....3c
5".....2c
4".....1c
3".....1c
2".....1c
1".....1c

RUBBER
1/16x2 25 ft. 8c
1/16x2 15 ft. 8c
1/16x2 10 ft. 8c
3/16, 10 ft. 8c

THRUST BEARINGS
Small, 1 doz. 10c
Large, 1 doz. 15c

WASHERS
1 doz. 1/4 or 1/2 1c

August 12-15—Oshkosh Exchange Club sponsoring gas and rubber meet at Oshkosh Airport Hangar, Oshkosh, Wis. Airplane rides. Dr. H. E. Bitter, director, 515 Ninth St., Oshkosh, Wisconsin.

Frontiers of Aviation

(Continued from page 11)

Pratt & Whitney Wasps delivering 600 hp. each for take-off. With a full load of 27,500 pounds, including 1100 gallons of fuel, the plane will have a top speed of 241 m.p.h., a cruising speed of 220 m.p.h. and a non-stop flying range of more than 2100 miles. Dimensions of the "Excalibur" are as follows:

Wing span—95 ft.; Overall Length—74 ft. 2 in.; Cabin Length—28 ft.; Cabin Height—6 ft. 4 in. Additional preliminary figures on the ship are as follows:

Propellers . . . Hamilton Standard Hydromatic, full-feathering.

Gross Weight . . . 27,500 pounds with 21 passengers.

Take-off Run at Sea Level . . . 980 ft. Maximum Rate of Climb with Four Engines . . . 1200 ft./min.

Absolute Ceiling with Four Engines . . . 24,000 ft.

Another of Lockheed's forthcoming transports is the Electra 16-E. It is the "Model 16" that has been in the process of design for quite some time and is a development of the Electra, the first of Lockheed's famous twin-engined transports. Of low-wing design, the plane will have compartments in the wing as well as in the nose for storing the mail and baggage. Provisions will be made for 12 passengers and a crew of two.

With a wingspread of 60 feet and an overall length of 45 feet the airplane will weigh approximately 11,500 pounds, including 200 gallons of fuel. The power plant consists of two 550 hp. Pratt & Whitney Wasp engines turning Hamilton Standard constant speed propellers. Special attention has been given to the design for rapid service, maintenance and inspection, as well as sound-proofing and thermal insulation.

Design of the plane has been completed and the first one will be ready in about five more months. The "Excalibur" will follow a few months later and should be flying early in 1940. Performance estimates of the Electra 16-E are as follows:

Top Speed at 8,000 ft. . . . 228 m.p.h.
Cruising speed at 11,800 ft. . . 228 m.p.h.
Takeoff Run at Sea Level . . . 860 ft.
Takeoff Time . . . 15 seconds.
Landing Speed . . . 65 m.p.h.
Rate of climb at Sea Level . . . 1410 ft./min.

Absolute Ceiling with Two Engines . . . 24,300 ft.

Service Ceiling with Two Engines . . . 23,000 ft.

Absolute Ceiling with One Engine . . . 10,000 ft.

One of a few tri-motored ships now in the design stage is Lloyd Stearman's plane known as the "Transair Model 17." Seating 17 passengers the airplane will have an engine mounted in the nose of the fuselage and two in the leading edge of the



THE PRECISION

WING SPAN 5 FT.
WEIGHT 2 LBS

- ★ Complete Kit including 3 1/2" Streamlined Air Wheels, precision cut parts, ready-cut ribs, bulkheads, motor board, etc. Also rust proof landing gear wire.
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See Page 37

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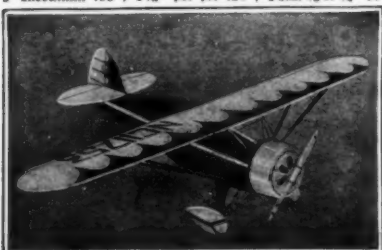
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General Flying Battery 50c.
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wing, all developing around 600 hp. It will be very economical to operate and will be used for feeder line service. The prototype is already in the process of construction following the completion of the wind tunnel test at the California Institute of Technology.

Fairchild's new military primary trainer that was completed in March and which is now at Dayton undergoing tests is an excellent little low-wing ship. Very clean in design, it sets two in tandem style in an enclosure behind an inverted 165 hp. Ranger 6-cylinder, in-line engine. It is of low-wing design, and according to Fairchild, the same method of construction is used as that in the Model "24." The landing gear is fixed.

We also hear that Vultee has completed their basic combat airplane that is similar in appearance to North American's BC-1. The Vultee is now at Dayton for tests. North American has now completed some BC-2 ships that are different from the BC-1 in many respects.

The last three planes of North American's last order for BC-1 airplanes were changed to BC-2 ships with many radical changes made. When we said in a previous issue that many new ships would soon come forth with "stub" wing tips only a short interval elapsed to prove our statement. First came the North American "50" single-engined fighter, the Stearman X-100, now the BC-2, and another North American creation, the new French trainer. They all have the "chopped off" wing tip and have proven it successful. The BC-2 now has an all-metal fuselage, integral fuel tanks in the wing, a higher horsepower engine, and newly designed rudder and ailerons. Construction of the airplane is superb and there is a rumor that North American has received an order for a large batch of these.

The first of the new design competitions has been opened. It was for attack-bombers and has nothing to do with the competition just preceding it in which North American, Martin and Stearman participated. The planes in the design competition are very much more advanced and will do well over 325 m.p.h. cruising. An advance rumor with no apparent foundation was that Curtiss won the competition. Bids on the basis of one plane and price per plane if an order of 1,000 was placed were:

Consolidated Aircraft	\$585,000	\$48,951
Curtiss-Wright	878,385	89,940
Glenn L. Martin	950,000	64,000
Bell Aircraft	504,000	78,000
Lockheed	1,225,000	75,540
North American	760,000	58,190
Douglas (Northrop)	742,000	55,623
Douglas	207,500	56,000

One of the most outstanding military creations at the moment is the Bell single-place pursuit plane. We mentioned this plane briefly a few months ago. It is a sleek low-wing ship with tricycle landing gear and three-bladed propeller. The nose wheel is mounted on a long leg attached to the fuselage just aft of the propeller spinner. The nose wheel assembly retracts backwards into the fuselage nose. The main landing gear retracts inwards into the wing.

The engine, a 1200 hp. Allison, is reported to be mounted at the center of gravity with the pilot sitting just forward and above it in a well designed glass enclosure.

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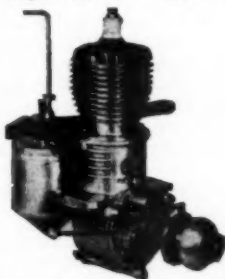
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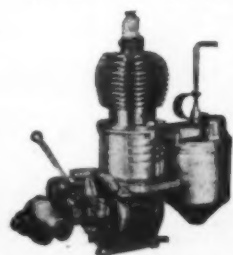


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Come in three sizes to fit any plug. Large, for Champions and A.C. plugs. Medium, for Hurler, Brown and Clipper plugs. Small size fits the new small V-2 Champion plug. Only 25c.

TWIN EXHAUST STACKS
Twin aluminum exhaust stacks for Browns and Mighty Midgets. 3" long. Keeps your ship cleaner and prevents dirt from getting in the cylinder. 75c.

REPLACEMENT NEEDLE VALVES
These needle valves are made especially to replace the regular valves on Model D Brown Jr., which are a little too sensitive for accurate adjustment. They will work very well on OHLSSON'S, GWINN'S, MIGHTY MIDGETS, BARY CYCLONER and many others. They give a remarkably broad adjustment and in many cases will increase the engine's performance. Only a few minutes are required for installation. Comes complete with length of synthetic rubber tubing for only 60c.

STREAMLINED PROPELLER SPINNER NUT
Dress up your model with one of these good-looking solid dural spinners. They replace the regular nut and washer, and weigh only 1 1/2 oz. Fits any motor with a 1/4" dia. shaft. Comes complete with special wrench, only 30c.

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This arrangement affords a narrow, sharp pointed nose that apparently cuts through the air with plenty of speed. The skin appears to be flush riveted and has very few obtrusions. A turbo-super-charger is mounted on the side of the fuselage. Though the location of the engine is unconventional the airplane has a conventional appearance except for the exhaust stacks and air intake located aft of the pilot. The tail of the fuselage is boom-like in appearance, and a well proportioned tail of single rudder design is mounted on it.

The wing is of good taper and is about 35 feet in length while the fuselage length is in the neighborhood of 27 feet. With the pilot and the engine near the center of gravity the airplane has exceptional maneuverability in spite of its fast speed and probably marks the ultimate in the maneuverability-speed combination that a pilot can physically withstand. Known as the XP-39, it has been purchased by the Air Corps for further experimentation, as has Seversky's XP-41, a new mid-wing pursuit-interceptor with turbo-supercharger.

A unique feature not present on other modern pursuits is that the Bell ship has a door on the side of the fuselage for ingress and egress of the pilot. Formerly a sliding enclosure has been employed. While on the subject of pursuit-interceptors we hear that Lockheed has received an order for 13 of their XP-38 twin-engined model from the Air Corps.

Recent orders placed by the Army and Navy are as follows:

\$1,516,357 to Douglas from the Navy for single-engined low-wing dive bombers.

\$204,000 to Grumman from the Navy for new airplanes.

\$2,346,127.87 to North American Aviation from the Air Corps which may be for BC-2 ships.

Howell W. Miller, designer of such planes as "Time Flies," the "Q.E.D.," and the "Zeta" sportplane has now produced a small, four-place, twin-engined, pusher monoplane; the HM-4. The engines are four-cylinder Menascos enclosed in nacelles mounted on the upper surface of the wing near the trailing edge. The airplane is a low-wing ship with the wing slightly gulled

as it tapers into the fuselage. A tricycle landing gear is appropriately used.

The pusher and nose wheel feature affords exceedingly fine visibility. Having a very good appearance, the plane should find a satisfactory market and will sell for about \$15,000.

Specifications of the Miller HM-4 which have been made public are as follows:

Wing span—38 ft.; Length Overall—26 ft.; Wing Area—216 sq. ft.; Top Speed—170 m.p.h.; Cruising Speed—150 m.p.h.; Landing Speed—55 m.p.h.; Wing Loading—16.5 lb./sq. ft.; Power Loading 14 lb./hp.; Gross Weight—3,600 lb.; Power Plant—Two 125 hp. Menasco engines.

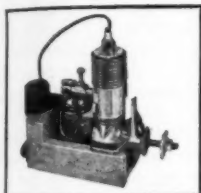
Mr. Ralph Beal, whom we mentioned several months ago as contemplating the manufacture of a flying wing, has now made arrangements with Aero Industries Technical Institute to build the first plane. It will have a wingspread of 41 feet and will carry two passengers. A true flying wing, all flight controls are located on the wing. Being rather clean in design it should perform very well and will be in the Cub class though perhaps slightly faster. A tricycle landing gear has been incorporated in the design.

Speaking of sportplanes, do not be surprised to see Clarence Chamberlain enter the field with the manufacture of a new light plane. As you probably remember, his last production ship was the "Crescent" of several years ago, a high-wing airplane similar to the Bellanca Pacemaker.

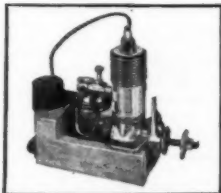
While Sterling Edwards is designing a new tail for their new twin-engined Continental "50" powered sportplane, the North Pacific Aircraft Corp. has begun test flights on another new twin-engined plane powered by two 50 hp. Menasco engines. The little ship certainly has eye-appeal. Of low-wing design, the plane has tandem seating for the crew of two in an enclosure above the fuselage. The small engines are mounted in nacelles extending from the wing which houses the retractable landing gear. Most important of all is the fact that the airplane is built of wooden geodetic construction and perhaps marks the first time an American airplane has been built by that method. Geodetic construction consists of

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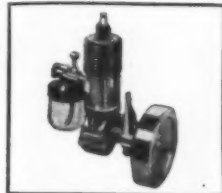


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Now is the time for someone to come out with a twin-engined, four-place sportplane powered by the new 65-70 hp. Continental engines and boasting of a nose-wheel. On Long Island, New York, a person by the name of Bruce Mayo, formerly with Seversky, has been working on the design of a small twin-engined, four-place ship powered by 50 h.p. engines. The interesting feature of this plane is that the engines are to be mounted in the leading edge of the wing with the propellers connected to long drive shafts extending through the wing chord to the trailing edge.

Up in Sacramento, California, the Universal Aircraft Company is building a small two-place, single-engined trainer with tandem seating arrangement. Designed to enter forthcoming Army training plane competitions it has a medium powered radial engine in the nose as well as a tricycle landing gear. It is of low-wing design with the tail mounted on a narrow cylindrical fuselage.

Here is some flash news on new designs just before we go to press:

Curtiss came out first in the single-engined pursuit competition with an order amounting to \$12,872,398, which consists of approximately 300 P-40 ships!

Lockheed received an order for a reported 13 P-38 twin-engined pursuit-inter-

ceptors at a cost of \$2,180,728.

Bell Aircraft's prize was a \$1,073,445 order for more "Airacudas."

But the headliner is that Consolidated Aircraft is building a four-engined heavy bomber that will be larger than the Boeing B-15. It is a development of Consolidated's trans-ocean flyingboats to be built in the near future in some respects. The new bomber, however, will be a landplane, and now that Consolidated has a sizable order for four-engined flyingboats for the Navy and their new twin-engined, 12,000 mile patrol bomber going through flight tests, things will certainly be humming in San Diego. The Army Air Corps has proffered \$2,880,000 for the development of the new Consolidated flying fortress!

All the above mentioned planes, except the Consolidated of course, will be advanced versions over their prototypes and will most certainly boost the Air Corps' standing.

Short Brothers' new four-engined transport being built in England will be a landplane with mid-wing and double-rudder tail. What Ho!! With all the war preparation that is going on the English have not given up commercial aviation entirely!

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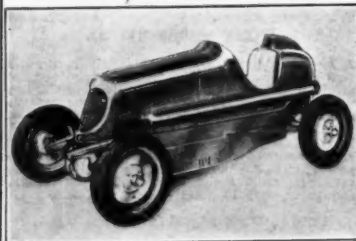
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Have You Discovered Crinoline?

(Continued from page 19)

it around and flowing it into the mesh. The cement softens the starch in the crinoline and when dry the unit which has been covered becomes as solid and as hard as stone. To cite a specific example, a one-wheel landing gear gas model built by the writer was first planked on the bottom, from the nose block to the rear of the wheel installation. (Landing wheel hung directly from fuselage bottom.) Soft balsa was used for this. It was then covered with crinoline, using an ample quantity of cement to adhere it. Cloth was then applied over the crinoline as the outer covering, followed by several coats of clear dope. This section, which comes in for plenty of abuse when the plane sits down in rugged country, has proved to be so hard and tough that nothing has harmed it to date, there being merely several slight scratches on the surface. If applied to the trailing edges of wings (using strips twice the width of the member, to complete a stretch with one piece) they become very hard and resistant to pulling up or down when covering has become taut. A gas model nose block of the removable type, which is made more on the order of a cowl, finishing with a thin balsa shell, can rarely be used in actual flight due to its delicacy. However, when covered inside and out with crinoline, it becomes sturdy enough to stand the severest of crackups.

Many other outlets for it for providing additional strength in your gas jobs are

awaiting your application. It might be mentioned also that a gas model propeller covered with it becomes a prop that just won't "say die."

Crinoline can be obtained at any department store where cloth of all types is sold. It costs only about 15c per yard, making it a trivial item indeed in this respect. Yours for longer-lived gas model aircraft equipped with crinoline, which reinforces balsa as steel reinforces concrete.

Gas Lines

(Continued from page 21)

tends to keep the center of lateral area fairly low. The whole plane emphasizes efficiency and also the highest degree of stability. Plecan is to be complimented on this job.

Picture No. 2 shows another very distinctive ship. The unusual feature of this plane is that it's a miniature hydro. Not only is it small in size but it takes off from the water with only a six foot run. It weighs only 28-1/2 ounces, which is remarkable for the weight of a hydro model. We note from the picture that the small area of the wing is compensated for by the use of a high cambered airfoil. This is good practice inasmuch as great lift is derived from little area. The ship is an "Eaglet" equipped with pontoons and was built by E. P. Lott of La Grange, Illinois, a pilot with United Air Lines.

Pictures No. 3 and No. 4 apparently show a full size plane on a flying field. If we told you this was true it wouldn't be hard to believe, especially if you examined the landing gear closely. Nevertheless this is merely a gas model equipped with one of the first practical, infallible, retractable landing gears. The ship was designed and built by Dick Roe of 3812 Clarrington Avenue, Culver City, Calif. He has written telling us something about it, so we will let him speak for himself:

"The pictures show what I believe to be the first gas model to be equipped with automatic retractable landing gear—that really works! Getting right down to details, the mechanism operates from a single timer (Auto-Knips) which is set to retract the gear into the ship's belly (a Grumman style) about 4 or 5 seconds after the plane is released for takeoff. The same timer then cuts the engine and extends the gear—ready for landing, a shock absorber automatically locking in place. However, it may be lowered at any time by making certain adjustments. These movements are not operated directly by the timer but accomplished by means of trips and levers controlled by the timer.

"Since the ship's completion in 1938 the mechanism, which is reasonably simple, has functioned perfectly and believe me, this sort of innovation sure adds a big kick to flying a gas model.

"The ship weighs approximately 5-1/2 pounds, has a 6-1/2 foot wing spread and is powered by an Ohlsson Gold Seal engine. She flies beautifully—fast and stable. To date it has won 3 trophies (2 first and 1 second out of three tries) and its share of the prize money in precision contests, popular here on the West Coast.

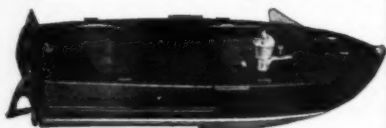
"Perhaps you are proffering the ques-

FIRST CHOICE..

WHEN ONLY THE BEST IN MODELS IS DESIRED

BUNCH models

Sea Hornet Speedboat



Enjoy gas powered speedboat racing this summer. Built like a regular boat; no trick assembly methods. Cut out and notched frames, keel, motor beams, balsa planking and fabric covering. Complete with drive shaft, propeller, rear strut, stuffing box and all fittings.

SEA HORNET

\$11.50

Scorpion gas models

World's top quality gas models. Complete with the best selected equipment to build and fly. "Auto-knips" flight timer, pneumatic wheels, carved propeller, covering, cement and dope.

SCORPION SENIOR (Inverted type) \$10.50

SCORPION MAJOR (Upright type) \$10.50



High performance 57" gas models designed for all Bunch aircraft and 1/5 h.p. engines.

Speed Demon

RECORD BREAKING!

Gas
Powered
Race Car



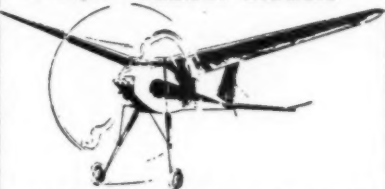
This is the speedy 20" gas powered race car that started this new, thrilling hobby. In the hands of Louis Meyer, America's most famous race driver, the amazing performance of the Speed Demon thrilled a crowd of thousands at Indianapolis this year.

Already Speed Demon owners meet and race on parking lots, street corners and tennis courts. Send for this Speed Demon kit today! Assemble and race the car famous for performance.

Composed of manufactured units, the front and rear axle assemblies bolt to the finished and drilled frame rails. New type "resilient" Gardner tires, wheels, and clutch drive assembly are ready to install. Bearings are fitted to the accurately ground steel axle and drive shaft. Air cleaner, exhaust stack, wiring, switch, shaped body blocks, and full size drawings with racing instructions complete the Speed Demon kit. The Speed Demon is designed for the Bunch Speedway or any suitable 1/5 h.p. engine.

SPEED DEMON \$16.50
(postpaid)

Cadet rubber models



World's record Bunch tapered wing duration models, complete with all parts to build and fly. With rubber lube, carved propeller and free-wheeler.

Cadet Major 30" (postpaid) \$1.50

Cadet Jr. 20" 50c (plus 10c postage)

Special—Both Cadets (postpaid) 2.00



Hot-Test BUNCH SPARK COIL

Developed to Bunch engineer's specifications. Smallest in size and "hottest" under tests in race cars, speedboats and airplanes. Weight 2 1/2 oz. Clip connections. Spauldite case. For a sure-fire spark insist on this Bunch coil

\$1.50

British Agents: 17 Brazenose St., Manchester, England

tion: Does the plane show any change in manner of flight with the landing gear up? The answer is emphatically, yes. Any change of speed due to decreased resistance is difficult to detect. However very noticeable is an increased angle of climb and a lessened tendency to succumb to torque with the resultant spiral dive.

"The parts for this mechanism are constructed of aircraft steel tubing and aluminum. It is surprisingly light, rugged and has withstood many a hard knock without being fazed."

Charles Gruber of 239 East Whiting Avenue, Fullerton, Calif., sends us picture No. 5, showing what he believes to be one of the smallest gas jobs ever built. He is in the act of tuning it up while two of his intimate friends (and mechanics) look on. It was the smallest plane in the G.M.A.A.S.C. contest last December and also the smallest one in the Pomona, Calif., meet in March. It performed well at each contest but didn't win any prize. It flies extremely fast and has

a very fast landing. Only its stability saves it from crack-ups; it rarely ever turns upon landing. The wing spread is only 24 inches; the length over-all being 15 inches. The total weight is 15 ounces. The wing area being exactly one square foot, the wing loading then comes to 15 ounces per square foot. A regular size two-cell coil provides the spark for the Brat motor.

Elbert J. Weathers of 2720 Poinsettia Drive, San Diego, Calif., always seems to be "putting one over" on us model builders. Now he comes out with the "Ozone Kid," shown in picture No. 6. It looks like an immense bat. However its looks belie its performance, for Weathers gives us to understand that it's ultra-stable. It has a very swift take-off and climbs in comparatively tight circles to the left, at a steep angle. There is no excessive banking on the turns and, believe it or not, the glide is extremely flat; the model flying in with the greatest of ease, especially when landing into the wind.

Weathers built this model as an experiment to test the extremely high lift airfoil, the Grant M-2 (or M-7), with which the wing is equipped. The tail is a Grant M-210. The wing is set on the fuselage at six degrees positive and the stabilizer at zero. Experimental part of the design involves the wing unit which, though of only 48 inches span, has a span chord of 12 inches. Another unorthodox feature is the fuselage which has a very narrow width though it has a great deal of side area. It is of "teardrop" cross section.

The ship is equipped with a 1/6 horsepower engine, though one of 1/5 horsepower can be installed with difficulty or danger.

East Paterson Contest

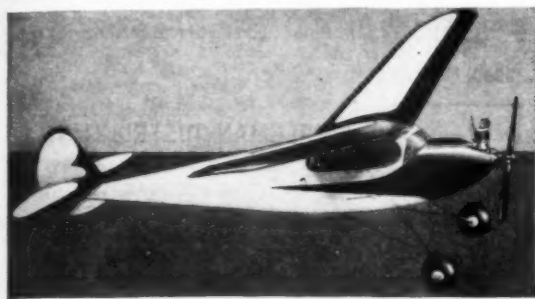
Some 300 contestants in all three gas model classes, displayed their craft on Sunday, May 21, before more than 8,000 spectators as the East Paterson Gas Model Club presented its first annual gas model meet at the Cherry Hill Airport.

NO MIRACLES—BUT!



THE DIAMOND DEMON

The newest in the BAY RIDGE line of top flight performers. A ship which set an NAA record the first time it left the starting line. New diamond-shaped fuselage and the most rugged Class B ship you have ever built. No other plane in the field approaches it at the price. Span 46", weighs 10 oz. per square foot ready to fly. Complete kit \$2.95 postpaid, including full size plans, airwheels, dope and cement.



THERMAL MAGNET

A plane that meets the demands of the most exacting builder. We asked Ray Heit to design a ship with a super climb, flat shallow glide and modern construction throughout. The THERMAL MAGNET was the answer. Six foot span, weighs 9 1/2 oz. per square foot ready to fly. Taper wing, high lift airfoil, shock-proof landing gear. A Class C record-maker powered by anything from a Baby Cyclone to a James. Special kit \$4.95 postpaid. Includes full size plans, dopes, cement, printed sheets. DeLuxe kit with air wheels and covering silk, \$7.50 postpaid.

We do know that expert model builders in the Metropolitan Area, men who have taken honors in most of the 1939 contests to date, have been among our best customers for years.

They have the utmost confidence in our supplies, our complete kits and our low prices, and we feel proud when they take home top contest awards, for in most cases either the material used in constructing the plane was purchased from BAY RIDGE or the plane was built from a BAY RIDGE kit.

We don't say that our kits are miracle performers, but we do know that when the jobs are built properly they will win more than their share of honors in the contest field. We purchase our supplies direct from the sources . . . our balsa is purchased from the importers, our metal parts come from the factories, and we even import our super landing gear wire.

We cater to the contest prize winners and to contest fliers . . . ask them about the BAY RIDGE spirit of co-operation, a spirit that makes for better planes, better flying and higher prizes.



THE MIKE

Another ship from the drawing board of designer Ray Heit, who made his reputation on this well performer. Recent improvements in design have made it one of the most consistent jobs in the Class B field. An outstanding flier for contest or sport flying. Four foot span, weighs less than 10 oz. per square foot ready to fly. Complete kit including airwheels and covering silk \$3.50 postpaid. Standard kit, less airwheels, \$2.50 postpaid.

BAY RIDGE MODEL AIRPLANE & SUPPLY CO.

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Dept. M-8

Brooklyn, New York

New Jersey

Hadley Field, N.J., one of the leading eastern gas model airports, was the scene of the annual Kresge Meet held June 3, which drew nearly 200 entries from leading builders in the eastern section of the country. The meet was sponsored by the Kresge Department Store of Newark, N.J., and contest rules covering all three classes of ship called for two flights with 20 second motor run.

Jack Findra Sr., who has been making Class C history so far this year, took first honors in Class C, with a total of 11:40 for two flights, his first being well over ten minutes. Mr. Findra's son, Jack Jr., took fifth in the same event with a ship similar to that used by his father, after the young man had lost a ship of his own design on a test hop. The Findra ships were powered by Brown Jr. motors, and resembled standard Buccaneers with a slightly larger wing. Roy Oliva took second with a standard Buccaneer doing 8:10 on two flights. Third was H. Spates with Magnus Anderson fourth.

Donald Huff did 5:28 on two flights to take Class B honors. Second prize winner was Harvey Wats, with Gordon Murray, defending champion, third in the

class. G. Moru and Gustav Jung were fourth and fifth, respectively. Frank Ehling, who placed in all three classes, took top honors in Class A. Second was Richard Boegehold with Jerry Stoloff third. Leo Shulman and Sal Taibi also placed in this event.

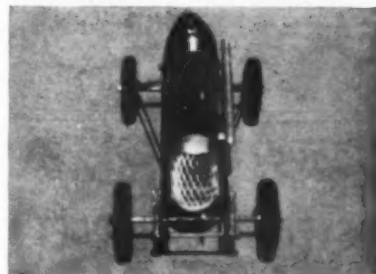
High point honors for the day were taken by Ehling, who received the Kresge trophy for his activity. All of Ehling's ships were similar, the little Class A job looking like a tiny shadow of his Brown-powered Class C ship.

New York

The Metropolitan Model Airplane Council (of New York) has announced an innovation in gas model contests, which will enable beginners in the gas model building and flying game to compete in meets with other beginners, and experts to compete with experts.

Two meets will be held during July to further this program. The first meet will be held on July 23, and all fliers who have never won better than a sixth place in a meet sanctioned by the M.M.A.C., or who have been building less than a year, will be eligible to compete. Winners in the novice meet will be eligible to compete in the expert meet which will be held on

THE "SCAT"



THIS WON'T FLY

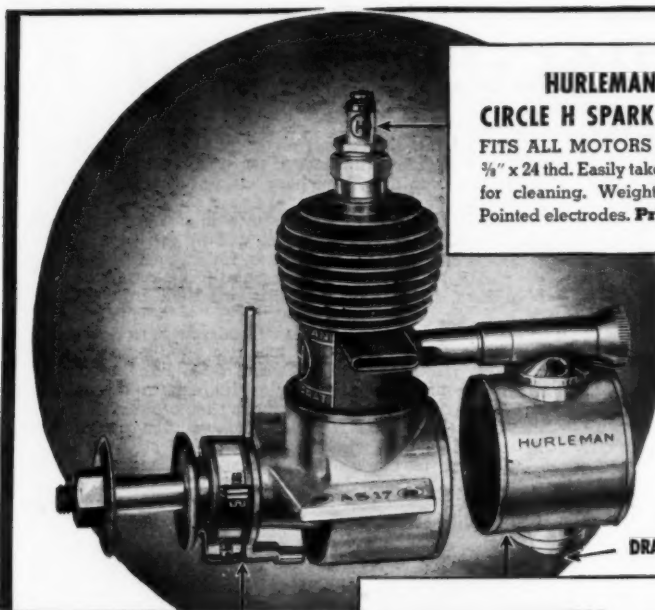
But Boy! How she **roars** around the track 40 to 60 M.P.H. Designed to take any 1/5 H.P. motor. This kit has everything equal to the more expensive kits on the market.

Improved friction drive unit. Chassis frame cut out. Cast aluminum-machined length 15". Semi-Finished body. Wheel Base 13". Tread 8". Axles cut and threaded. Simplified plans (fully detailed). Springs drilled and bushed.

Complete \$6.50 Kit packing and postage 50c

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HURLEMAN CIRCLE H SPARK PLUG

FITS ALL MOTORS having
 $\frac{3}{8}$ " x 24 thd. Easily taken apart
for cleaning. Weight $\frac{1}{4}$ oz.
Pointed electrodes. Price 75c

POWERED FOR PEAK PERFORMANCE

The New HURLEMAN ARISTOCRAT MOTOR

A custom built job made to sell at a mass-production price! 1/5 H.P. Bore $\frac{3}{8}$ ". Stroke $\frac{13}{16}$ ". Displacement .488 cu. in. Standard equipment includes 2-piece spark plug with pointed electrodes; special timer for perfect ignition at top-speeds; new style carburetor; ignition coil with special mounting clip; and condenser. PRICE (F.O.B. Phila.) complete and ready to run **\$21.50**

Write for booklet showing complete line.
Please enclose stamp.

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HURLEMAN IGNITION TIMER

FITS ALL BROWN MOTORS. Can be adapted to any make motor. Replace defective or inefficient timers with Hurleman timer for peak performance. Adjustable tungsten breaker points. Price **\$2.50**

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FITS ALL MOTORS. Both metal and glass types are easily taken apart for cleaning. When ordering specify O. D. of intake manifold.

Glass tank $\frac{1}{4}$ oz. Price **\$2.50**
Metal tank $\frac{1}{4}$ oz. Price **\$3.00**



Build—This New—13½ ft.



SPORT- CRAFT KAYAK

Control and Uncovered View of PCC-2
Two Man Racing and Cruising Model—Fast—Portable—Weights only 35 pounds. Just the thing for Week-end Vacation Trips. Complete Construction Kit containing all wood parts cut to correct shape, spar varnish, dope, canvas for covering, paint, plan and instructions, etc. Price only.....\$17.95
Paddle included free if you rush order.
One Man Model PCC-1—Length over 10 ft.
Complete Kit—Price.....\$10.00

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And New Pay As You Build Plan
SPORTCRAFT KAYAKS
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BOYS!

STEER YOUR MIDGET or SOAPBOX RACER

with newly invented

"JOYSTICK"

operated steering mechanism.

Only Two Simple Parts

necessary to make. Saves space, makes your car easy to operate. Hooks to stub axle assembly. Send only **\$1.00** for plan and instructions.

M. J. REDLING

P. O. Keasbey,

New Jersey

July 30. Here's a chance for the novices.

Entrants will be asked to state their particular grouping at the time of enrollment. Locations of the meet have not, as yet, been decided upon, but those wishing to enter the meet are asked to communicate with Bill Effinger, Secretary of the M.M.A.C., 230 Steuben St., Brooklyn, N.Y. Trophies and merchandise prizes will be awarded to winners in each group. Entrants must be members of the club affiliated with the Council.

I.G.M.A.A. Unit No. 1

The No. 1 unit of the reestablished I.G.M.A.A. is going at full speed. What do you think they have done now? They have substituted action for talk and have actually established a model airport which is to be used exclusively for the model fliers in the vicinity of Pittsburgh. It's called the Allegheny County Model Airfield. This is the second I.G.M.A.A. model flying field; the first such airport was established in California by I.G.M.A.A. members of that state. It was officially opened by the first contest of the Allegheny Mountain Area on Sunday, May 21st. Harry G. Vogler, publicity chairman, 303 Lowell Street, Pittsburgh, Pa., sends us a report.

At the first Model Wings Contest staged on the Model Wings Field, located near Mt. Lebanon in the Pittsburgh District, the members of Unit One helped a great deal toward making it a success. In fact the first two places in the gas section of this meet was taken by I.G.M.A.A.

members, with only a total lapsed time of three-fifths of a second dividing first place from second, and with the final difference of time on three official flights being one-fifth of a second.

There were a great number of gas powered models on the field bearing the insignia of the International Gas Model Airplane Association, Unit Number One, and the group placed first, second and sixth in gas. The contestants who placed in this group in the meet were George Gaydos, LeRoy Willard, and R. K. Allen.

Further, the group expects to participate in all the contests held over the area; first with meets at Elm Grove, Clarksburg, Bowling Green, the A.M.A. competitions at Butler and others in the area. Any unit may secure information of pending contests at Headquarters of Unit One, I.G.M.A.A., 114 So. Sheridan Avenue, Pittsburgh, Penna. They may participate in these events and also should any information be desired concerning the contests in Pittsburgh, a self-addressed, stamped envelope will secure full particulars for each individual.

Other contests which will take place in the Pittsburgh area are:

July 23rd, A.M.A. Contest; August 5th, Junior Aviator Eliminations; August 20th, and September 17th, A.M.A. Contests.

Ohio

The American Airlines Gas Model Club (a West Side Club), held a gas model contest against the Balsa Butch-

TIME TO FLY NOW



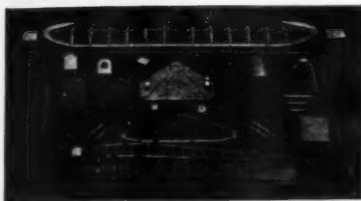
Summer is no time to spend at the workbench.

Buy a **WIT-KIT** and get into the air in ONE TENTH the time.

The **WIT-KIT** is prefabricated. An ingenious, scientific method (patent pending) shortens building time and lengthens flying time.

The **WIT-KIT** built in a jig, is stronger, flies longer.

Actual photo of
"BIRD in flight"



Patent Pending

Examine This **WIT-KIT**

See what we mean? This is why we say, "Why be old-fashioned? Razor blades are out." Fly more, learn more. Note: In gas models, fuselage sides are built up, and wing parts formed.

All engineering and design under direction of B. RUSSELL (Russ) SHAW, Early Bird, and former chief designer for Wright Brothers.

WIT-KIT MODELS

Two famous gas models, the **WITEAGLE**, 48 inch, and **TRIAX**, six foot, tricycle landing gear sensation of the gas model field. \$3.95 and \$9.95 p.p. without wheels, props and motors.

Five Jig-Built, Quick Built Rubber Band Models:

WITFLY 18"	\$1.00 p.p.
WITRAINER 18"	1.50 p.p.
WITMASTER 30"	1.95 p.p.
WITBIRD 22"	2.35 p.p.
WITHAWK 32"	2.95 p.p.

If your dealer can't supply you, order direct.

WRITE FOR FOLDER



DEALERS: Send for prices and merchandising plan

DESIGNERS OF THE AIR-TRACK RADIO SAFELANDING SYSTEM AND OTHER INTERNATIONALLY KNOWN RADIO AND FLYING AIDS

ers (an East Side Club) on the East Side of Cleveland, Sunday, May 7th, with a total entry of 34 models. The victory went to the American Air Lines Gas Model Club; this club having nine members "in the money" against one member from the East Side Club. Winners were as follows:

First Prize won by Richard Korda.
Second Prize won by Bill Schwab.
Third Prize won by Harold Coovert.
Fourth Prize won by Rodney Mitchell.
Fifth Prize won by Ralph Mitchell.

Best original Design, won by Robert Besse. Best Crack Up, won by Ray Weil. Youngest Entry having the best time was Frank Dunn. Youngest Entry entered in Contest was Edward Istivan.

All these winners belonged to the American Air Lines Club, except Richard Korda.

An entry fee of 25 cents per member was charged and the winning club received the total amount of the entry fees.

This club would like to hear from members of any clubs interested in having a contest during the summer. Address communications to The American Air Lines Gas Model Club, headquarters at 9609 Lorain Avenue, Cleveland, Ohio.

T. W. Summers of "The World-Herald," Omaha, Nebraska, sends us the following news release:

Plans for the "World-Herald's" gas model airplane show on the Benson park golf course are nearing completion, with July 23 set as the date. A contest board

is busy drafting rules which will be ready soon to mail to participants. Entrants will be divided into three groups, junior, senior, open class. There will also be a small bore engine event.

Pennsylvania

Bobby Kauffman of the Wynnfield Gas Model Association won the first monthly meet of the Philadelphia Gas Model Association on April 23rd. He flew a small Buccaneer powered with an Ohlsson "23" to a time of 53.9 seconds. Bob Jacobson of the P.M.A.A. was second with 53.8 and F. Fullmer was third with 48 seconds. All times were so low due to a very high wind.

Notice

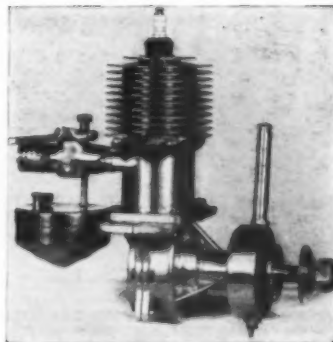
Earl B. Danelson of 814 S. 18 Street, Newark, N.J., writes and says he is an old member of the I.G.M.A.A. and now hears this organization has been reorganized, and he would like to become a member again. The new I.G.M.A.A. organization is composed of units only, and not of individual members. We suggest that he get in touch with Mr. William Bouldin 3rd, 169 Prospect Street, East Orange, N.J., as we believe he is interested in forming a unit. Any other fans who live in the vicinity of Newark and care to join the I.G.M.A.A. should also contact Mr. Bouldin.

The Eastern States Contest will be held at Hadley Field, N.J. August 12th.

THE NEW
MERCURY
GAS MODEL BY SCIENTIFIC
See Page 37

the **1939**

FORSTER



The most modern motor!

FORSTER BROTHERS offer you the most outstanding improvement—throttle controlled speed and power! There's nothing like it! Choose the exact speed and power you want, to test hop, to leisurely cruise, or to skyrocket in competition!

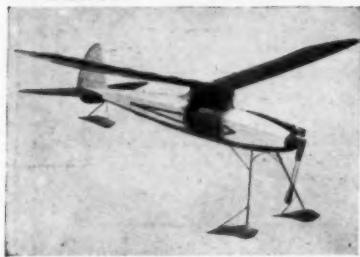
Speed and Power are today's need. FORSTER motors give you all that plus reliability! Ask the owners! Recommended for planes of five foot wing span and up. For radio controlled ships, none is better suited!

See your dealer or write for our new catalog today.

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DOUGLAS
DESIGN

AGAIN FIRST IN LINE



Fairchild "24" Now \$1.00

plus 15c postage. Same quality (kit less only colored dopes) formerly sold for \$1.95 * 1/4" Scale Span 26 1/2", Length 17 1/2", Wt. 2 oz. The model pictured has made many long stable flights. Simple to construct and a beauty in appearance and performance.

FREE CATALOG: OF THE FINEST GAS AND RUBBER POWERED MODEL KITS AND SUPPLIES OBTAINABLE. OUR SUPREME GRADE BALSA IS UNBEATABLE.

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ANNOUNCING! THE NEW 100% IMPROVED "HUSKY" JV.



What do you look for in a motor? It's precision, isn't it? That's essential. Then you probably want a motor with extra power, easy starting, and built to give you long lasting service. The new "Husky" more than meets these requirements. When you buy a "Husky" you can be sure of a square deal—as we guarantee you complete satisfaction.

We have made several new improvements on our latest "Husky"—Special new connecting rod, and crank shaft made stronger—more power produced by change of carburetor intake and ports—auto type timer—and new needle valve with spring lock.

Special Notice! We have been asked by our largest dealers to keep the Husky in class "A" N.A.A. ruling—they claim the "Husky" is the leading motor in this class—displacement, .19 cu. in.—win with a Husky—order yours today.

Specifications. Wt. ready to run 6 oz. with coil, condenser, carburetor, plug and two pencils for current. 1/8" Bore, 1/4" Stroke—Height 3 1/2", Length 4 1/2"—Speed 250 R.P.M. up to 8000 R.P.M. using an 11" prop.

"HUSKY" JV. MODEL

ORDER YOUR HUSKY TODAY! IMMEDIATE DELIVERY.
Husky motor mounts, wt. 1/2 oz., per pr., postpaid 50c
Husky Non Brittle prop. 11" or 12" each, postpaid 75c
Post paid \$12.50

Husky complete ready to run (less motor mounts, batteries and prop.) Post paid \$12.50

GAS MODELERS
ATTENTION!

Chicago's Foremost Model Shop stocks all the best Gas Engines and Gas Kits, ready for immediate delivery.

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SMALL BORE ENGINES AND GAS KITS

Gas Engines	Piper Cub.....	3.95
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Brat.....	Buccaneer "46".....	2.55
"Husky" JV Model.....	Cavalier "60".....	4.95
	The Eaglet.....	3.95
	The Cephalopod.....	5.95
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Gas Engines	Gas Kits
Brown Jr. "D".....	Megow Commander.....
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Herkimer Deluxe.....	Comet Zipper.....
Denny Deluxe.....	Curtis Robin.....
Denny Standard.....	Buccaneer Stan.....
Denny Unit.....	Courier Sport.....
Gwin.....	Miss America.....
Gwin Kit.....	Red Zephyr.....
Mighty Midg.....	Streamliner.....
Synco Special.....	Air Chief.....
Forster.....	Zenith.....
Forster B.....	Taylor Cub.....

All Engines and Gas Kits ordered will be shipped the same day and Postpaid.

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a new two in one endurance model landplane or seaplane FEATURING Hexagon fuselage with shaped sides * One blade folding prop. * Shock proof landing gear * Detachable wing. Fuselage and landing gear * Bear claw floats * Meets N.A.A. rules. Span 34"—Length 25"—Wt. 2 oz.

COMPLETE KIT \$1.50 post paid



also formed. Before assembling the firewall be sure all of the holes are drilled and the coil and condenser are mounted securely on the back of it. Dope the firewall and fuselage nose with two coats of "black" followed up with two coats of "clear." This is to make it resistant to the destructive action of gas and oil.

Prepare the metal motor mount from half-inch angle duraluminum. Also make the landing gear fittings, tail skid and tail mount fittings out of duraluminum. After assembling these to the fuselage the structure will be ready for covering.

Wing

All of the ribs in the center section are the same shape and size but the rear of the tip ribs are cut off to fit flush with the trailing edge. The wing is assembled in three sections, and upon completing, the two tips are joined to the center section, adding the twelve inches of dihedral.

Double Paper Covering

The wing, fuselage, and tail assembly are all double paper covered. Covering in this manner produces a strong and durable coating for the plane which will not split into long tears when punctured.

Place the tissue on the parts to be covered with the grain of the tissue running lengthwise. Spray with water and follow with two coats of clear thin dope. Add another layer of tissue with the grain running crosswise to the first covering. Spray the second coat with water and apply two coats of heavy clear dope.

Tail Unit

Try to make the tail units as light as possible, so that the wing may be placed closer to the nose. This will increase the longitudinal and directional stability. Fill in around the metal mounting parts with 1/8" sheet balsa to produce a more rigid assembly.

That's all there is! Hope you have a winner!

Air Ways

(Continued from page 15)

an unusually "natty" little ship. Norris Malphy of Buffalo, New York, is responsible for this one. It is the Payne Knight Twister, plans of which he drew up from pictures and other data. One would have to look twice in order to determine that this ship was not a gas powered model. It is very realistic and this young man evidently knows how to build biplanes, for he has kept the area of the wings down to a minimum. In such ships the chord should be reduced and the wing span made quite large. You will notice that the gap between the wings is apparently excessive. However this is perfectly correct for this type of model as it not only gives greater efficiency but it adds to the stability and looks.

Picture No. 4 might well be taken for a photograph of a full scale ship. Actually it is a solid scale model of a Fleet, built by Stanley Orzek of 1 Morton Street, Framingham, Mass. It was made from plans appearing in MODEL AIRPLANE NEWS, the details of which enabled him to do a good job. All cockpit details are included in

A Record Breaking Gas Model

(Continued from page 13)

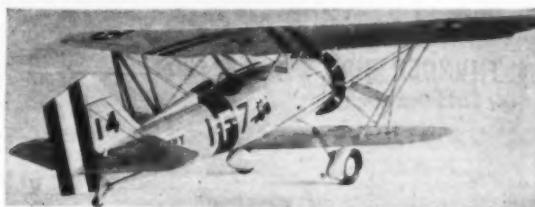
Make an accurate full size drawing of the side view of the fuselage on drawing paper. Place this on a large flat piece of soft wood and hammer one inch brads along the outside edges at close intervals. The longerons are one-quarter inch square very hard balsa. Hold these over the mouth of a steaming tea kettle and bend to the approximate fuselage outlines. Cut the fuselage uprights, making a duplicate of each and place them between the longerons, using plenty of cement.

Pull out all of the brads after the sides have dried. Remove them from the drawing and split the sides apart with a thin double edged razor blade. Obtain a large sandpaper block and sand both sides of the fuselage until very smooth.

Pin one side of the body to the work bench, cut two of the longest cross pieces in the top view to the correct length and cement them in their proper place. Then lay the other side of the body on top of this making sure that all sides are square. After this has dried glue the tail posts including the tail skid together, wrapping well with silk thread. The rest of the top cross pieces are easily glued in place.

Trace the outlines of the nose on a piece of 3/32" plywood and cut to shape with a coping saw, gluing them between the longerons. The 1/8" plywood firewall is

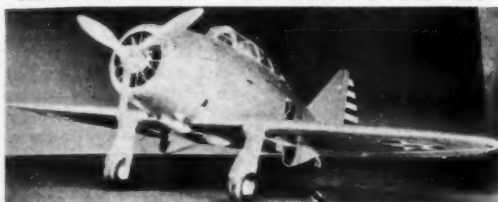
NEW CURTISS HAWK F11C4 NAVY PURSUIT



32 1/2" Span. Length 22 3/4". 1" Scale. Weight 6 oz. Color grey, top wing yellow.

THE MOST EXCLUSIVE AND FINEST EQUIPPED MODEL IN THE WORLD. MOVABLE CONTROLS WORK FROM COCKPIT. A special de luxe model, one of the most beautiful ever made. Set contains a 1 1/2" scale Wright Cyclone celluloid motor, detailed push rods, pins, etc., like real motor, 4 1/2" aluminum cowling, 10" steel type carved prop shown, 2 1/4" wheels, tail wheel, star and rudder insignia and lettering, rubber, windshield, instrument board, flying wires, 4 aluminum step plates, aluminum wing walks, ready cut wheel pants, washers, 3 oz. grey paint, 1/2 oz. yellow, 1/2 oz. red, 2 oz. glue, etc. All other parts are printed on balsa wood. 33"x34" scale drawing. \$4.50

NEW SEVERSKY P35 ARMY FIGHTER



32" Span. Length 25". 1" Scale. Color, Silver

A brand new model of the 1935 Bendix Trophy Winner P 35. Set has 4" turned balsa motor front, 10" carved prop, balsa wheels, tail wheel, rubber, all parts printed on balsa, 3 oz. silver dope, 1/2 oz. black, 2 oz. glue, etc. insignia, and full size 5 1/2" scale drawing. Const. set in labeled gift box, postpaid.

NEW DOUGLAS O43 GAS MODEL



50" Span. Length 38". Weight with motor, 1 1/2 lbs.

A real scale gas model with top performance. All parts printed on balsa, set of colored paints, insignia, tail wheel, etc. Model uses small Onision "33" gas motor.

NEW
GAS
MODEL
\$4.95

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Less Motor,
Wheels, and
Prop.

BOEING F4B4 NAVY FIGHTER



22 1/2" Span. Length 14 1/2". 3/4" Scale

Set has 3" celluloid motor, 3 1/4" tapered aluminum cowling, set of paints, etc. Postpaid. \$2.95

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BOEING P26A ARMY PURSUIT



22" Span. Length 17 1/2". 3/4" Scale
Set has 3" celluloid motor, 3 1/4" tapered aluminum cowling, paints, etc. Postpaid. \$2.75

NORTHROP A-17 ARMY FIGHTER



24" Span. Length 17". 1/2" Scale

Set has 7" prop, turned motor front, wooden wheels and complete set of paints. Postpaid. \$2.50

NEW 20-PAGE CATALOG, beautifully illustrated, with large photos of the world's finest scale models. SEND 10c COIN.

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the plane and the engine is carefully built up. Orzeck wishes us to give a message to other boys in the neighborhood of Boston, as he believes they may have a hard time to find a suitable flying field. He says:

"Since the hurricane some time past blew away the hangar the Framingham Airport is not active, and will not be for a couple of months. This airport is a swell place to fly gas jobs as it has fields surrounding it on all sides and there are not very many obstructions. It has good thermal possibilities and roads to chase the models if necessary.

"I was talking with the owner of the field and he is only too willing to let modelers use the field if they behave properly and do not drive cars out on the field during this time of the year. If any model builders are interested in the field I would appreciate it if they got in touch with me."

In picture No. 5 we see what David L. Alexander, Jr. of Aiken, South Carolina, P.O. Box 290, thinks a modern fighter should look like. Previous to modifications this plane was a model of the Hughes racer. However Alexander got his originality operating and substituted twin rudders for single, cut down the fuselage length and added a cabin for the rear gunner. Three machine guns are located out-

side the propeller arc in each wing. A small cannon is supposed to fire through the propeller shaft, when the ship is equipped with a single blade propeller. This is certainly a snappy looking job and in full scale, is good enough to adorn any country's air force. Alexander is Air Ways Club member No. 107.

We cannot let a month go by without printing a typical example of fine workmanship, which usually consists of the uncovered framework of a plane. In picture No. 6 you see Joe Oliver's Boeing 314 Clipper. It has a span of 47 inches and will be covered with sheet balsa. It is being built from Boeing blueprints and so far has required about 150 hours of work. Don Wallace, a friend of Oliver's, is also making a model of the same ship. Oliver lives at 750 North Prospect Street, Kent, Washington.

It does not require a very keen perception to see that model airplanes are providing a complete airplane construction course to young men. If anyone has a more constructive hobby than model airplane building to suggest, we wish they would write us "special delivery" immediately: We have been looking for such a hobby for over ten years and as yet haven't found it; perhaps you can.

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Completely assembled gear box drive with HARDENED STEEL GEARS keyed to shafts at no extra cost. New type high speed universal joint. The first all metal Miniature Race Car. All parts completely formed, no cutting or filing necessary. All parts made in jigs and fixtures, assuring easy assembly of all parts. Demountable rims on wheels, heavy duty tires. Tread 6 1/2"; wheel base 12 1/4"; weight less motor and accessories 4 1/4 lbs. Assembly time not over 2 hrs. Arbor turned flywheels 2" dia. 6, 9 or 12 oz. \$1.50 plus 15c postage.

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45" Model weighs only 16 oz. due to simplified monocoque construction. Complete kit with air-
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Special**

1/2 H.P. Motor with coil, condenser, oil and 14" prop only

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and your old motor.

**NATIONALS HOLD UP YEAR BOOK!**

• When you read this, the 1939-40 Year Book will be practically finished. However, we are holding it up until after the National and Wakefield Competitions. We want to give you the very latest designs and aerodynamic information for the 1940 season. And there is no doubt that these two meets are the proving ground for Model Aeronautics.

• The reason that we are combining the 1939 and 1940 Editions is that we have finally decided to write a large and thick Handbook on Model Aeronautics. Since we can just about handle one book per year, we thought it best to keep the year continuance by combining the two years.

• The Year Book will be ready for distribution in September. Not earlier because we will be very busy during July and August working on a brand new publication!

"Nationals and Wakefield in Pictures"!!

• How many of you have yearned to be at the Nationals and Wakefield, yet circumstances made it impossible? And have you ever wondered just what charm these meets have on the participants to make them yearn about their adventures for years and years? We feel that you have waited long enough for the "inside story" and so the new idea in model publication.

• "Nationals and Wakefield in Pictures" will be a 44 page, 8x10, photographic and written record of these two meets. Cameras will be expertly handled by model builders so that you will get just the views you want to see. If at all possible, we will try to include three-views of the winning models and special designs. We plan to print only 2500 copies unless orders on hand guarantee more. So, order your copy right away to be sure of receipt. Price is only 75 Cents postpaid anywhere.

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1/4x1/8 12 for 5c
1/4x1/8 10 for 5c
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1/4x1/4 3 for 5c

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1/4x1/4 3 for 11c
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1/4x1/4 99c
1/4x1/4 100c

Alum. Tubing
1/16.....6c ft.
1/8.....8c ft.
3/32.....10c ft.
1/4.....12c ft.
5/16.....14c ft.
3/8.....16c ft.
1/2.....18c ft.
5/8.....20c ft.
3/4.....22c ft.
7/8.....24c ft.
1.....26c ft.
1 1/8.....28c ft.
1 1/4.....30c ft.
1 1/2.....32c ft.
1 3/4.....34c ft.
2.....36c ft.
2 1/4.....38c ft.
2 1/2.....40c ft.
2 3/4.....42c ft.
3.....44c ft.
3 1/4.....46c ft.
3 1/2.....48c ft.
3 3/4.....50c ft.
4.....52c ft.
4 1/4.....54c ft.
4 1/2.....56c ft.
4 3/4.....58c ft.
5.....60c ft.
5 1/4.....62c ft.
5 1/2.....64c ft.
5 3/4.....66c ft.
6.....68c ft.
6 1/4.....70c ft.
6 1/2.....72c ft.
6 3/4.....74c ft.
7.....76c ft.
7 1/4.....78c ft.
7 1/2.....80c ft.
7 3/4.....82c ft.
8.....84c ft.
8 1/4.....86c ft.
8 1/2.....88c ft.
8 3/4.....90c ft.
9.....92c ft.
9 1/4.....94c ft.
9 1/2.....96c ft.
9 3/4.....98c ft.
10.....100c ft.

Gas Model Supplies
1/4x1/4 1c
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1/4x1/4 5c
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Comet Kits
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Prop Shafts—doz.
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1/4x1/4 8

M&M's .292 CU. IN. OR 4.78 CU. CM. DISPLACEMENT PISTON-VALVE-MOTOR

We Pioneered the Way in Pneumatic Wheels—Now We Again Pioneer the Way with
THE FIRST MAJOR IMPROVEMENT ON TWO-CYCLE MOTORS IN 60 YEARS
DESIGNED AND BUILT FOR THOSE WHO WANT THE BEST IN MOTORS

RECOMMENDED PROP
 11½"x8" PITCH

You Can Invert This Motor in a Few Seconds

**M&M .292
 STREAMLINED
 INVERTED**



Fully Covered
 by Pend.-Pat.

Years Ahead in Motor Design

M&M .292 — \$16.50, Postpaid

Complete Ready to Run with 2-4 Volt-Pen-Cell Coil-Plug-Condenser
 POSTPAID—No Extra Charge to Foreign Countries

If located in Washington add State Tax.

Dealers: Our New Discounts Are Very Attractive.

Builders—Send for Free Illustrative Literature

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When Thinking of Model Protection
 Think of M & M Super Gas
 Wheels

M & M 3¼" GAS WHEELS \$1.50 P.P.
 For Air Mail Add 25c

M & M'S NEW 2½" WHEEL Designed
 for SMALL GAS MODELS ONLY \$0.90.
 For Air Mail add 17c.

3½" & 4½" Gas wheels—Now only \$2.75
 per pair, postpaid.

M & M'S FOR LARGER GAS MODELS
 Size 6"x1½". Price \$4.50 per pair P.P.



All M & M wheels can be inflated and deflated

M & M MODEL WHEEL CO.

325 NORTH 79TH STREET

SEATTLE, WASHINGTON, U.S.A.

**Check These Exclusive Features Found Only
 In The M & M .292**

MORE POWER AT SLOWER SPEEDS

It is not necessary to run this motor at burn-out speed to develop power. The slower the motor speed, the less wear on the motor.

400% MORE PISTON SEAL

Only motor with full length piston seal (holds compression better).

ROTATING PISTON—PERMITTING EVEN CYLINDER WEAR

It is impossible to hold compression with an egg-shaped piston and cylinder.

NO LOSS OF POWER WHEN MOTOR IS HOT

Due to even piston and cylinder expansion and even wear.

ONLY MOTOR WITH FULL LENGTH CYLINDER COOLING FINS

Adds strength and resists damage in event of crack-up.

SPECIAL DESIGNED CAST IRON PISTON AND CYLINDER WITH CENTRAL INTAKE PORT AND CIRCUMFERENTIAL EXHAUST

Permitting quicker fresh gas intake and rapid disposal of burnt gases. This also adds more power.

PERFECT STREAMLINING

MOST POWERFUL MOTOR IN THE N.A.A. .30 CU. IN. DISPLACEMENT CLASS

FULL TUBE CARBURETOR NEEDLE, WITH MICRO-GAS ADJUSTMENT

No threads or pin holes to get clogged or damaged. It can be easily taken apart for cleaning.

TOTALLY ENCLOSED POINTS

Special designed case. Impossible for bearing or cylinder oil to foul contacts.

OTHER FEATURES

TRANSPARENT GAS TANK which can easily be filled through hole in cap. Tank can also be easily taken apart for cleaning.

M & M .292 CAN BE RUN UPRIGHT OR INVERTED

You can invert this motor in a few seconds.

M & M Super Heavy Duty Wheel for Rubber Powered Models

SIZES 1¼"—1½"—1½"—1½"—PRICE \$0.50 Per Pair, Postpaid.

SIZES 1½"—2"—2½"—2½"—2½"—2½"—and Special Designed DeNur Wheels, Size 1½"—PRICE \$0.90 PER PAIR, POSTPAID. For Air Mail Add 11c.

ASK TO SEE OUR WHEELS AT THE DU-POINT EXHIBIT AT NEW YORK AND S. F. FAIRS

take place at the Baltimore Municipal Airport, the home of the Clipper ships. Come and see some of the largest ships in the world and make your trip to Baltimore a double-purpose visit."

New York

The first 1939 rubber meet to be sponsored by the Metropolitan Model Air Council, was held Saturday, May 20, at Holmes Airport, Queens, N.Y., and was participated in by some 60 of the best rubber builders in the New York area. The Queens Aero Model Association, which has been one of the leading contenders for point honors in the council throughout the year, took top honors in the meet.

Pennsylvania

Victor R. Fritz, field director of the Philadelphia Model Aeroplane Association, writes:

The Flying Keystone Model Airplane Club, Chapter 12, will sponsor the greatest outdoor model airplane program ever organized in the Lehigh Valley. This program will consist of ten meets at the Allentown-Bethlehem Airport. Five of these meets will be that of gas models, while the

other five will consist of rubber powered models. The officers are as follows: Elwood Matten, President; William Barba, Vice-President; Harland Bright, Secretary; Russell Fahringer, Treasurer; Ernest Schaffhauser, Director.

NOTICES

Mr. A. C. Appel of 2617 Shenandoah Avenue, St. Louis, Missouri, sends out a call for help. He says he has been trying for five years to obtain the January, February, March, August, December 1931 issues of MODEL AIRPLANE NEWS.

Schools

We have heard from many aeronautical schools to the effect that they are ready and waiting to give full cooperation in the instructing of students who are taking part in America's program for preparedness in the air. Only official action is necessary now to give every young man, regardless of economic conditions, an opportunity to learn and serve a modern trade.

Aeronautical Project

Colonel Roger Q. Williams is doing a fine work in the interest of aeronautical

THE NEW
MERCURY

GAS MODEL BY SCIENTIFIC

See Page 37

**BUILD THIS 7-INCH
 MIDGET
 RACER**



**EASY TO MAKE AUTHENTIC
 MODELS OF MOST FAMOUS
 RACERS FROM THIS KIT**

Kit 1. Printed and semi-finished balsa wood parts, 1¼" balloon type wheels, wire, 3 colors of lacquer, full size plans, instructions. 50c

Kit 2. Same as Kit 1 PLUS real type steering gear, numbers for sides and "Offenhauser Motor" detail. 75c

Kit 3. Same as Kit 2 PLUS hinged aluminum hood, leather upholstery, rear bumper, aluminum axles and BALLOON RUBBER WHEELS. \$1.00

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Advertise in this directory for quick profitable results! Rates 10c per word. Minimum 20 words. **REMITTANCES MUST ACCOMPANY ALL ADS FOR THIS DIRECTORY.** Advertisements for the September issue must be in by July 10.

MODEL AIRPLANES—KITS—SUPPLIES

BALSA WOOD Planks—Dealers, Clubs, Manufacturers! Buy Balsa Planks direct from the importer at tremendous savings. Write immediately. State quantities interested in. American Enterprises, 5118 13 Ave., Brooklyn, N.Y.

DEALERS and Jobbers: Write for discount price list on washers, thrust bearings, and propeller shafts. Kaywalt Manufacturing Co., 2702 Dwight Ave., Dayton, Ohio.

BROWN AERO RUBBER—Hodgman Rubber Company, 261 Fifth Avenue, New York City. Chicago Office: 412 South Wells Street. Dealers and manufacturers only.

DEALERS, Clubs, Schools: Send for low, complete wholesale list, including gas model supplies. Save money. Model Airplane Utility, 5307 New Utrecht Ave., Brooklyn, N.Y.

DEALERS, Jobbers—Real profits on rubber and gas supplies. Stamp brings wholesale list. Modelers write for retail list. Waterbury Model Builders Supply, 119 Cherry St., Waterbury, Conn.

FREE—Get your copy of the 1939 GMS Super-Catalogue today. "Everything for Gas Models." Gas Model Specialties, 128 West Washington, Syracuse, N. Y.

BARGAIN—Completely assembled and tested $\frac{1}{8}$ h.p. engine, plus kit with prop, wheels, and all other parts necessary to construct a strong, steady flying gas model. Price only \$11.00 prepaid. Modern Airplane Supplies, 31 Seton Rd., Larchmont, N. Y.

NEW—Fixed jet carburetors for improved motor performance. Entirely different. Write for details. Emil Rahm, 117-35 123 Street, South Ozone Park, N. Y.

DEALERS—Send for wholesale price list on rubber, cement, dopes, thinner, rubber lube. Triboro Model Supply, 35-21 MA 32nd St., L.I.C., N. Y.

AIRPLANES, Automobiles, Boats, Leathercraft, Railroad, Catalogs 10c per subject; lot 25c. Refund first order. Lange's Model Supplies, R.708, 20 E. Jackson, Chicago, Illinois.

CUSTOM BUILT Gas Models. 65" Bellanca "Airbus" (Bunch) \$15.00; Standard Buccaneer (Synro) \$30.00; Commodore (Brown) \$45.00. All timer equipped. Test hopped. F.O.B. Art Kronfeld, 215 Mountain Ave., Arlington, Mass.

FAMOUS Comet Clipper powered by New Brown Built to order. Expert Workmanship. Complete, test flown, ready to fly. Quotations and delivery dates on request. Tel Stephens, Jr., 2544 Wabash, Fort Worth, Texas.

BOOSTER Plans. Rakelits—two pieces—one in plane weighs 1.18 ounce. Complete 50c postpaid. B & B Model Aircraft Company, 2725 Frindville St., Chicago, Ill.

ATTENTION Dealers, Clubs, Schools: Send for low wholesale list price including gas model supplies. Write now and save. Cole Model Supply Co., Dept. S, 30 Coles St., Brooklyn, N. Y.

50" FLYERS: Ryan ST, containing finished wheel pants and aluminum prop spinner. Howard DGA-9, containing 5" aluminum cow. \$1.00 each at your dealer or direct. H & F Model Airplane Co., 459 Bristol St., Brooklyn, N.Y.

ATTENTION: Gas Model Builders. We service miniature gas motors and stock new motors and motor supplies. New England Miniature Motor Service, 6 Jefferson St., Suite 2, Winthrop, Mass.

LOOK!

MERCURY

GAS MODEL PROPS

2 FOR 25¢

Any size 9-10-11-12-13-14 machine made by the World's Largest Propeller Manufacturer.

ORDER NOW AT
THIS SENSATIONAL
PRICE FOR SUMMER
FLYING

MERCURY
1017 Third Ave. Los Angeles, Calif.

education. At present he is engaged in giving a series of nation-wide lectures, as well as carrying on experimental flights. These flights serve to introduce many young men and women to the art of flying. To date Col. Williams has talked to about 25,000 people. This activity is part of a plan sponsored by "The Reader's Digest," who, in this way, is endeavoring to do its bit toward preparedness.

Correspondents

Here we have an appeal from a young man in far-off Australia: Mr. A. Grieve of 28 Langridge Street, Nairfield Park N20, Victoria, Australia, wants to know if some young man about 15 or 16 years old who is interested in model building, will correspond with him. He has many experiences and much data which he has accumulated from experiments about which he can tell. Here is a chance for some model builder.

Originality Contest

Mr. David L. Alexander Jr. of Aiken, S.C., wins the Originality Contest for this month. The winning plane is shown in pictures No. 8 and No. 9. In picture No. 9 the little model of the Douglass is not part of the winning ship, as it appears to be.

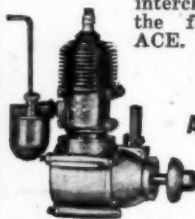
There are many unique things about this model which are not apparent at first glance. First of all, Alexander is correct on what is required of a high performance pursuit plane. Of primary importance is maneuverability, and the whole character of the ship is significant of this quality: The wings are very close to the C.G.; the engine is right over the center of lift. This fact enables any plane to maneuver swiftly and precisely. Aerodynamically it has unusually clean lines and with the pusher type propeller the model should respond beautifully.

Alexander has incorporated in this ship a type of landing gear which is used on the latest Bell pursuit job. This is the only thing which we can criticize, though it has been put into actual practice on army planes. Frankly, your editor doesn't believe that this type of landing gear will prove to be satisfactory in high speed craft which, of necessity, must occasionally land on rough ground. Perhaps you can visualize the result of the slender front landing gear strut and wheel coming into contact with some soft ground or even a small bump. If this collapses during a landing which is necessarily at high speed it will be "just too bad," as the ship will immediately assume the functions of a groundhog and probably would require a steamshovel to unearth it after it got through burrowing its nose into the ground. On the regular type of landing gear this cannot occur even if the landing gear should collapse: The plane wouldn't nose into the ground but would pancake on the belly of the fuselage.

We do not hold Alexander responsible for making what we believe is an error in his design. He has had plenty of example in full size craft to draw from, and has only been following their lead. This is the only point which we see in which he has not been original. Nevertheless it is not sufficient to rob him of the award, as in other respects his craft is exceedingly outstanding and excellent in design.

SYNCR ACE SPECIAL

Here's the performance you've wanted. Designed to permit either vertical or inverted mounting without dismantling. Parts are interchangeable with the famous Synro ACE.

**\$9.95****At Your Dealer**

Ask him for full information—or write for FREE Catalog.

SYNCR DEVICES, INC.

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now available at the cost price of \$1.00. Over 300 dealers listed. Send for your copy now as supply is limited.

Model Airplane News, 551 5th Ave., NYC.

DEALERS

Send on letterhead for your FREE COPY of brand-new 16 page Catalog. Complete selections of latest championship gas and rubber-powered supplies, Specialties, Kits and Motors.

DIAMOND MODEL AIRPLANE CO.
260 (H-8) Troy Ave., Brooklyn, N.Y.

GAS MODEL AIDS!

HEIGHT GAUGE—To check your dihedral accurately and quickly, locate flying surfaces, detect warpage.

PROTRACTOR GAUGE—To set negative or positive incidence of flying surfaces, locate thrust line, etc.

DECORATING PLANS—New color scheme layouts, designed by a qualified artist and model builder. Improve the appearance of your finished plane. Set of 12, \$1.

CLUB DECALS—Colorful slide-off transfers to identify your club planes. Easy to apply. Low prices in moderate quantities. Submit your design.

INDIVIDUAL DECALS—Hand-painted emblems for wing tips, rudder, or fuselage. Slide-off transfers attach easily. Brilliant colors.

LICENSE DECALS—Standard 4" black letters and numerals for NAA license numbers on wing. 5c each letter or numeral. Add 3c postage for each 10 numerals ordered.

STARTING DISC—Aluminum disc, weight $\frac{1}{4}$ oz., takes place of front washer on prop. Wind rope in groove and pull. Gives two full revs. Fine for balky motors. Safety handle. 50c each.

Please write for circulars

BEEBE PRODUCTS CO.

Box 841

Rockford, Ill.

MOHAWK IGNITION PARTS

FREE! Valuable booklet "Gas Model Ignition." Send stamp to cover postage.

Midjet Switch.....25c
Toggle Switch.....35c
Jacks & solderless plugs 2 for 15c

Hook up Wire—6 ft. for 15c
Best condenser.....25c

Ready-to-use Ignition Wires, Lugs attached, 5 for 25c

Orders over 50c sent postpaid

DEALERS WRITE!
MOHAWK MODEL CO., 4170 Ge. mantown Ave., Philadelphia, Penn.

HERE ARE THE AMAZING NEW FEATURES



CARL GOLDBERG, whose genius made these Comet models possible.

presented to a startled world
COMET and CARL GOLDBERG



The **COMET MERCURY**

\$2.95

KIT No. T11
Postage 25c;
none if ordered
from dealer.

MORE FEATURES than you've ever seen packed into a gas model—FEATURES that create new standards of performance—FEATURES proved by hundreds of test flights! The ZIPPER's breathtaking climb and floating glide will thrill and amaze you! And look at this partial list of contents: FINISHED RITZ PROPELLER—aerodynamically efficient. FINISHED ALUMINUM MOTOR MOUNTS—fit all motors. READY FINISHED PLYWOOD FIREWALL and front ring. WING AND ELEVATOR RIBS accurately cut. WING AND ELEVATOR SPARS tapered. STREAMLINED BALSA WHEELS. READY-FORMED LANDING GEAR. COMPLETELY FINISHED MOTOR LOCK FITTINGS. Plenty of COLORED BAMBOO PAPER, CEMENT and DOPE; dressy ZIPPER decal. All Necessary Hardware. Full Size Plans.

Specifications of the COMET ZIPPER

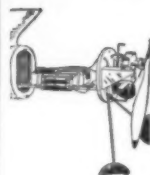
Wingspan, 54"; Overall Length, 34 1/4"; Wing Area, 3.44 sq. ft. (495 sq. in.); Total Weight (with motor), 30 oz.; Wing Loading, 8.7 oz. per sq. ft.; Wing Airfoil Goldberg G5; Power Plant, Any 1/5 or 1/6 h.p.; Climb, 2000 ft. per minute.

A folder, "How to Adjust and Fly the Zipper and Mercury" by Carl Goldberg, free with each kit.

KIT No. T10
Postage 25c;
none if ordered
from dealer.

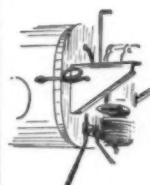
NO WONDER IT WINS CONTEST AFTER CONTEST!

9 out of 11 Meets



Detachable Motor Unit and Battery Track—At the slightest suspicion of ignition trouble, you can instantly detach the motor unit and battery track, and inspect closely every inch of wiring, and every possible source of trouble.

"Automatic Pilot" Wing Mount—Hundreds of flights have proved it makes models so stable, so much easier to fly, that it's like having an automatic pilot in your ship!



Motor Locks Hold Motor—Why didn't somebody think of this before? They hold with absolute firmness, detach instantly, safeguard motor in hard landings, and never need replacement.

Shock-proof Wing and Tail—One of the greatest developments in Gas Model history! The Goldberg method of mounting wing and tail allows them to fly off undamaged in event of a hard collision, and thus lightens the stress on the fuselage.



Kit Completeness—So many finished parts that building time is cut down tremendously. Absolutely the most complete kit in its class.

Examine it at your dealer's now



NEW FEATURES NOW EMBODIED IN THE 1939 COMET CLIPPER

Because of the undying popularity of the Comet Clipper, it has now been revised—a new 1939 Clipper—incorporating all the latest, approved ideas in gas model construction. For example:

ALUMINUM MOTOR MOUNTS—IMPROVED. DETACHABLE MOTOR UNIT—IMPROVED. DETACHED IGNITION TRACK—IMPROVED. STURDY WING WITH POLYHEDRAL—NEW, CLEAN-CUT FUSELAGE—FINISHED RITZ PROPELLER—COLOR-ED BAMBOO PAPER.

With all these new improvements, the price remains at only \$4.95. Kit No. T7 POSTAGE, 25c. None if ordered from dealer.

NET MODEL AIRPLANE & SUPPLY COMPANY

ADDRESS: 129 W. 29th St., CHICAGO. Dept. MN8. Eastern Branch: 688 Broadway, NEW YORK

Maintains distributors in many cities throughout the United States and other parts of the world. Foreign distributors: F. P. Sweeten, Blackpool, England; E. J. Hyams and Son, Wellington, C.I., New Zealand; PACIFIC COAST DISTRIBUTION, Edw. Kapitanoff, 4846 Hollywood Blvd., Los Angeles, Calif.; Smalley Paint and Paper Co., 5300 Ballard Ave., Detroit, Mich. Exclusive Distributor Detroit Area: Airco Model Supply, 13329 Charlevoix Ave., Detroit, Mich.

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Whether you fly to win or just for the sport, you want the finest motor performance you can get. And Ohlsson 23—outselling all other “small” motors—gives it to you at a rock-bottom price! It pays to own a quality motor. Advanced designing, exact engineering, and high-grade steel construction cost less in the end. Give you more fun from the start! Don't speculate—invest in an Ohlsson 23 and get today's finest engine for your model, today's biggest value for your money! Price only \$16.50 at your dealer's.

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